



# BIOREGIONS

Forest bioeconomy in action

## Perceptions on the Bioeconomy in the Basque Country

Results from a regional survey targeted at government and industry

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## 1. Executive summary

The Bioregions Facility launched its Bioeconomy Perceptions Regional Survey in the Basque Country in the period April - July 2022 as a bilingual survey, in Spanish and Basque (Euskera). The Survey was targeted at different groups within government and industry, to understand how they perceive the bioeconomy, its benefits, and its challenges. More specifically, the Survey aims at achieving six target outcomes: i) understand how business and policy actors perceive the bioeconomy; ii) revisit value chain priorities and related communication efforts; iii) identify barriers & supporting conditions; iv) assess “willingness to engage” with the bioeconomy; v) get insights on how to improve collaboration with government & industry and; vi) find key leverage points for bioeconomy development by identifying overlaps with other policy areas. Here we present seven key highlights, one per target outcome, of the Survey in the Basque Country.

- Respondents generally perceived **bioeconomy as a promising economic model**, highly related to sustainable land management and circular economy, and providing several environmental benefits. Respondents see the contribution to renewable materials, reduced carbon emissions, circularity, and biodiversity conservation as the most relevant positive impacts of the bioeconomy.
- Bioeconomy is perceived to be highly linked to **circularity, sustainable land management and use of biomass for multiple purposes**.
- Basque business and policy actors suggest that **bioenergy** is the bioeconomy sector with **highest potential for growth in the Basque Country**. **Wood construction** is perceived the sector with second highest potential.
- **Lack of profitability & market demand for bioeconomy, Limited co-operation among different stakeholders** (policy, business, etc.), and **Lack of supportive policy & legislative environment** are perceived as the most important **barriers for bioeconomy development**. **Investment in innovation** and the **availability of scientific information** are perceived the most important **supporting conditions**.
- **Industry and government** respondents indicated **high willingness to develop the bioeconomy**.
- **Government and industry respondents felt similar about who is responsible for different tasks in moving the bioeconomy in the Basque Country forward**. Respondents indicated that government and industry are more or less equally responsible for investments in research, development, and innovation. Industry reported that government is slightly more responsible for ensuring positive environmental and social impacts while government respondents perceive the responsibility to be equal in between government and industry. In addition, both groups emphasised that the government is more responsible in communicating and promoting the bioeconomy among the general public.
- According to respondents, **bioeconomy has strongest goal alignment with circular economy and technological innovation**. Respondents also reported strong goal alignment with environment related policy areas, such as clean energy and climate change mitigation & adaptation. Rural development is another policy area perceived to have strong goal alignment with the bioeconomy.

## 2. Regional context

The Basque Country is an autonomous community located in northern Spain. It occupies an area of 7,234 km<sup>2</sup>, with a population of approximately 2.2 million people. The Basque Country is one of the most important industrial concentrations in Spain (Basque Country Forest Bioeconomy profile, 2021<sup>1</sup>). The region produces about 6% of the national GDP and has the second-highest regional GDP per capita in Spain.

With regards to innovation potential in the Basque Country, the region is among the strongest innovators in Spain. The Basque Country invests €1.5 billion in research, or 1.8% of the regional GDP (2019). About 20,000 people were fully dedicated to R&D in 2019: this was a record high. The region is ranked as a “moderate +” innovator in 2019’s Regional Innovation Scoreboard, and innovation performance has increased over time, up by about 8.8% from the previous decade (Basque Country Forest Bioeconomy profile, 2021). The Basque Country was rated 8 out of 10 for its maturity in bioeconomy readiness and thus it can be considered to have a mature bioeconomy Research & Innovation ecosystem (European Commission, 2017<sup>2</sup>).

The Basque Country has a high proportion of the land area covered with forest in comparison with other EU regions. Namely 54% of the region’s land area is wooded (400,000 ha) (Libro blanco del sector de la madera, 2016<sup>3</sup>). The total wood stock is estimated at 62.6 million m<sup>3</sup> with an annual increment of 3.4 million m<sup>3</sup>/year. The total volume of wood harvested annually is 35% of the annual growth (about 1.2 million m<sup>3</sup>). About two-thirds of the available biomass in the Basque country is related to the forest and wood sector and another quarter is municipal waste (biodegradable municipal waste and hazardous post-consumer wood), the proportion of agricultural biomass is low (Basque Country Forest Bioeconomy profile, 2021). All this suggests that there is potential for an expanding forest bioeconomy.

The wooded area in the Basque Country is divided almost equally between hardwoods (52%) and conifers (48%) (Libro blanco del sector de la madera, 2016<sup>4</sup>). Covering 33% of the wooded area, radiata pine is the most abundant species. In order of importance according to their extension, radiata pine plantations are followed by beech forests and Atlantic mixed forests, gall oak and holm oak. Summing all those species, we reach almost 70% of the area of the Basque forests. Conifers and, in particular, radiata pine constitute the bulk of commercial extractions (79% of total authorised logging in 2014). Among the hardwoods, eucalyptus accounts for 89% of the cuts. Approximately two thirds of the wood used by companies in the sector comes from the Basque Country.

The wood sector provides almost as much wealth and employment to the Basque country as the banking and insurance sectors. The timber sector contributes 1.53% of the GDP. The Basque wood business is dominated by small companies —almost 95% of the companies have fewer than 20 employees— 4.8%

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<sup>1</sup> Basque Country Forest Bioeconomy profile (2021): [https://bioregions.efi.int/wp-content/uploads/2022/01/Basque-Country-regional-profile\\_August-2021.pdf](https://bioregions.efi.int/wp-content/uploads/2022/01/Basque-Country-regional-profile_August-2021.pdf)

<sup>2</sup>European Commission (2017). Bioeconomy development in EU regions. <https://op.europa.eu/en/publication-detail/-/publication/15189f4a-2216-11e8-ac73-01aa75ed71a1/language-en>

<sup>3</sup> Libro blanco del sector de la madera (2016).

<sup>4</sup> Libro blanco del sector de la madera (2016).

are medium-sized companies, while large companies with more than 200 employees are exclusively paper companies. The wood-forestry sector employs around 18,000 people full-time, of which 11,760 directly. Biannually, the International Forum of Architecture & Construction in Wood, named Egurtek, takes place in the Basque Country. It is a meeting point for architects and engineers and all those professionals of the industry who have connections with wood construction. Egurtek is impelled by the Basque government demonstrating their dedication to wood construction.

The vision of the Basque bioeconomy roadmap is to make the Basque Country a reference region in bioeconomy, promoting the generation and consolidation of high added value economic activities based on the optimal exploitation of regional resources. The Basque bioeconomy roadmap has received 3.9 million euros of investment (2019-2020) from the Basque government to boost and promote the regional bioeconomy ecosystem<sup>5</sup>.

Bioeconomy is a core element of the Basque Circular Economy Strategy 2030<sup>6</sup>. The Basque government's Circular Economy Strategy 2030 identifies the bioeconomy as having a high potential for providing solutions to eight of the nine challenges for the implementation of circular economy and, specifically, on the potential of forest bioeconomy, promoting the demand for a Basque Forest Bioeconomy Road Map.

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<sup>5</sup> Bioeconomía En Euskadi Bilbao, 9 de marzo de 2020

<sup>6</sup> Basque Circular Economy Strategy 2030:  
[https://www.euskadi.eus/contenidos/documentacion/economia\\_circular/es\\_def/adjuntos/EstrategiaEconomiaCircular2030.pdf](https://www.euskadi.eus/contenidos/documentacion/economia_circular/es_def/adjuntos/EstrategiaEconomiaCircular2030.pdf)

### 3. Results

#### 3.1. About the respondents

We targeted groups working within government and industry in the Basque Country. More specifically, we were interested in the perceptions of intermediate and high-level managers / decision-makers within municipal and regional governance, and local industry and business leaders, entrepreneurs, clusters, local industry associations and membership groups, farmer/forester associations, land managers and cooperatives within the private sector.

Due to survey dissemination methods, it is not possible to estimate accurately the number of people who received the survey. A total of 49 people responded to the survey, 11 respondents said to be from Government (or related public sector) (22%), 28 from Industry (or related private sector) (57%) and 10 respondents identified themselves as not being part of government or industry but rather of another field (20%) (Figure 1). Out of these 10 respondents, four wrote very clearly that they work in local associations and enterprises or are a forest owner. As we consider these actors to belong to the category “Industry (or related private sector)”, we reallocated their answers as belonging to the “Industry” group for the further analysis. The six remaining respondents in the “Other” category specified they work in research or provide services to the primary sector.

The majority of respondents were male (61%) (Annex A1). The vast majority of responses were received from the age groups 45-54 (43%) and 55-64 (43%)– likely due to the survey’s aim of reaching industry leaders and mid-to-high-ranking government officials. There were no respondents in the age groups 18-24 and 65+. 4% of respondents belonged to the age group 25-34 and 10% to the age group 35-44. Most respondents (57%) both live and work in the Basque Country, but there were also those who only live in the region (39%) or only work in the region (4%). Most respondents live in urban areas (61%), in comparison with those who live in rural (20%) or semi-rural/suburban (18%) areas.

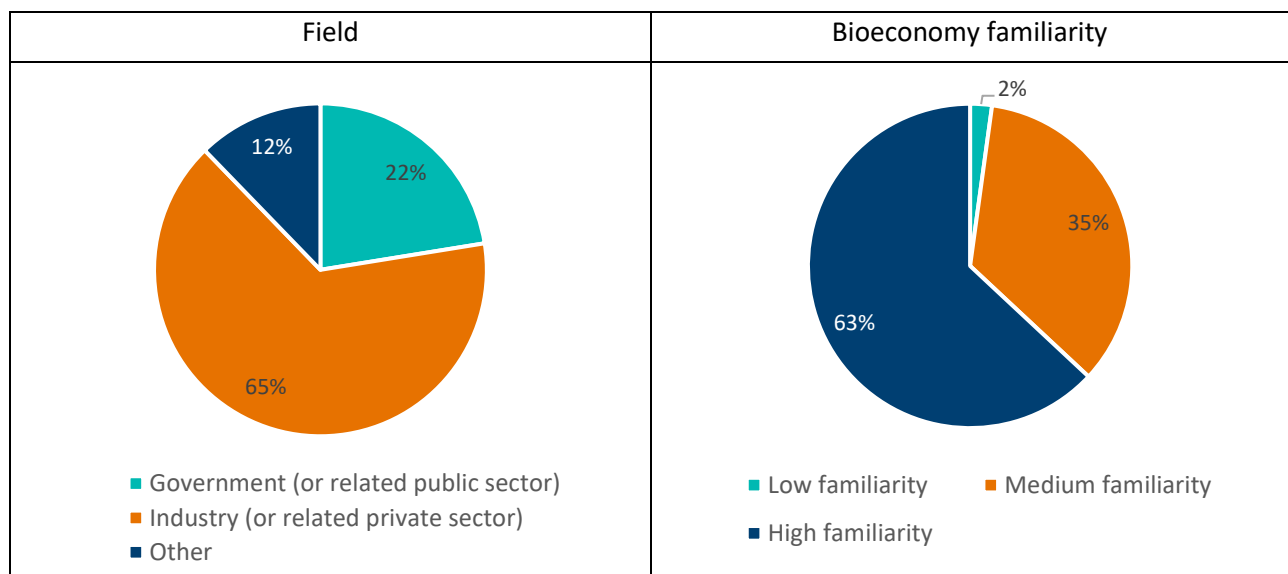


Figure 1: Characterisation of respondents according to field and bioeconomy familiarity. Additional charts related to the characterisation of the respondents can be found in Annex 1.

Most respondents reported good familiarity with the bioeconomy, with 63% indicating high familiarity and 35% indicating they had medium familiarity with the bioeconomy (Figure 1). 2% of the respondents reported having low familiarity with the bioeconomy.

### 3.2. Understand how business and policy actors perceive the bioeconomy

Respondents were asked which concepts and sectors they see as part of the bioeconomy, what are the main benefits and risks of the bioeconomy in their region, and what is the perceived level of public awareness.

*Circular use of resources* (by 91% of respondents), *Sustainable land management* (by 83% of respondents) and *Use of biomass for multiple purposes* (by 78% of respondents), were most understood to be a part of the bioeconomy (Figure 2 **Error! Reference source not found.**). *Carbon neutrality* (72%), *Sustainable consumption* (70%) and *Nature-based solutions* (70%) were indicated by the majority of respondents to be a part of the bioeconomy. Interestingly, concepts such as *Technological advancement* (48%), *Economic prosperity* (48%), *Community resilience* (37%) and *Degrowth* (26%), were less considered by respondents to be a part of the bioeconomy. Also, *Local and traditional food movements* (46%) and *Ecosystem services* (46%) were considered by less than half of the respondents to be part of the bioeconomy.

Summarising, respondents see sustainability, circularity and biomass use most linked to the bioeconomy. On the other hand, the bioeconomy is considered less relevant for economic and technological development.

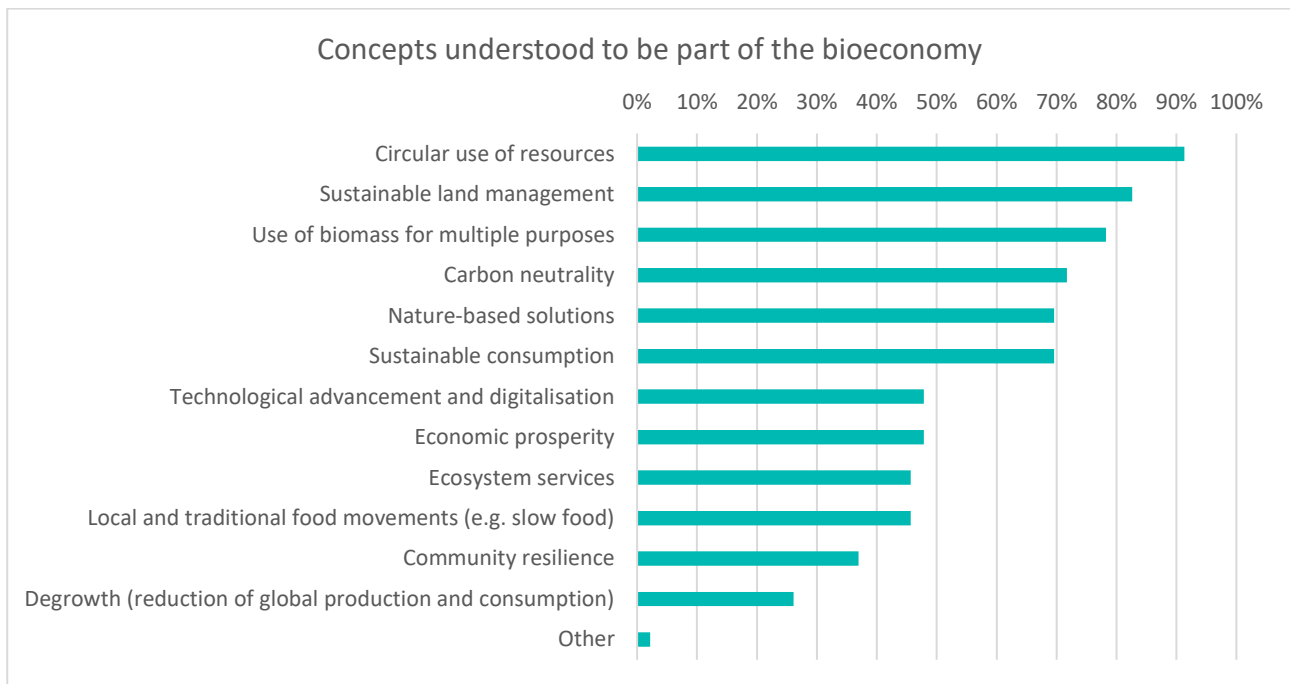


Figure 2: Proportion of survey respondents that understand certain concepts to be part of the bioeconomy. Respondents were allowed to select as many concepts as desired. Proportion is expressed as percentage of respondents.

In terms of primary production, bioeconomy is perceived to be more linked with *Agriculture* (93%) and *Forestry* (89%) than with *Fisheries and aquaculture* (78%) (Figure 3 **Error! Reference source not found.**). Many respondents consider *Waste management* (83%) and *Biotechnology and pharmaceutical* (72%) as part of the bioeconomy.

Among downstream sectors, *Energy* (83%) and *Food and gastronomy* (72%) receive most consideration. *Chemistry* (65%) and *Construction* (63%) are other secondary sectors perceived by more than half of respondents to be part of the bioeconomy. *Textiles* (48%), *Health and wellbeing* (43%), *Tourism and recreation* (39%) and *Machine industry* (24%) are sectors that are less considered to be a part of the bioeconomy. In addition, 2 respondents defined *Other* sectors that they understand to be part of the bioeconomy, mentioning plastics and pulp & paper.

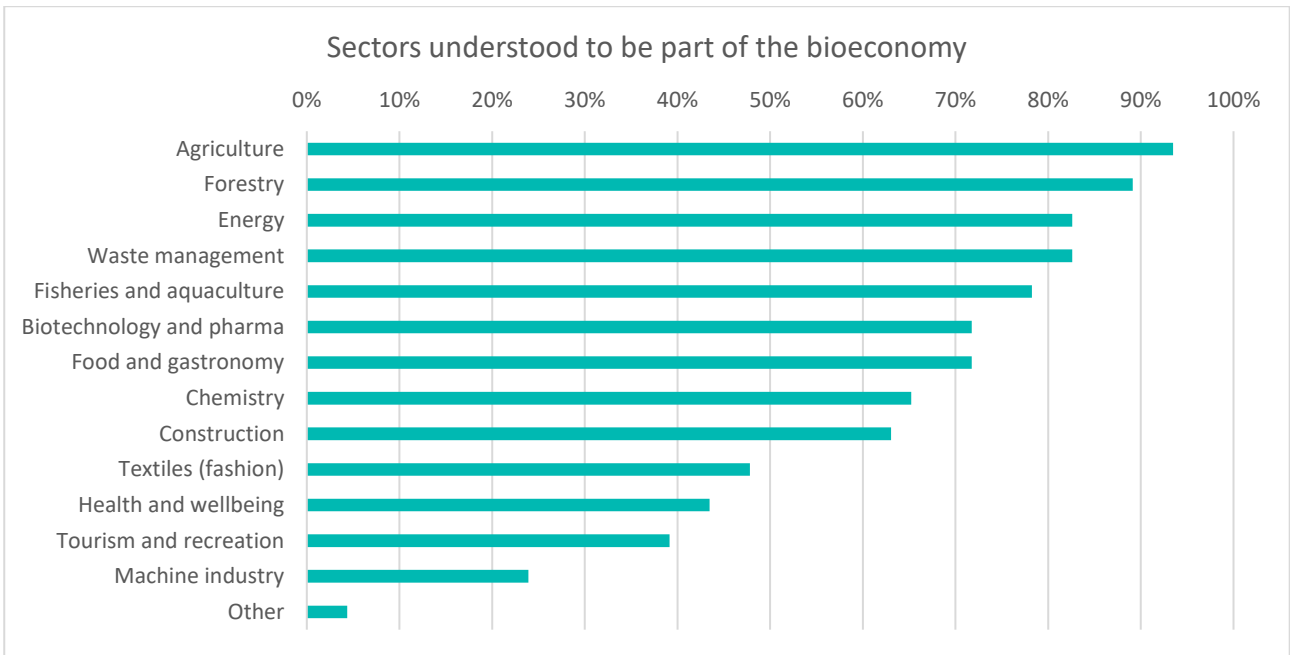


Figure 3: Proportion of survey respondents that understand certain sectors to be part of the bioeconomy. Respondents were allowed to select as many sectors as desired. Proportion is expressed as percentage of respondents.

As shown in Figure 4 **Error! Reference source not found.** below, based on true/false statements, the vast majority of respondents agreed on the positive impacts of the bioeconomy, e.g., that the bioeconomy provides business and innovation opportunities, helps mitigate climate change, contributes to sustainable economic growth, provides benefits to rural areas, reduces our dependency on fossil fuels and creates new jobs. On the other hand, a low proportion of respondents do perceive some risks of the bioeconomy as *contributing to deforestation* (7%), *inducing stress on natural systems* (10%), and *not enough biomass to implement the bioeconomy* (14%).



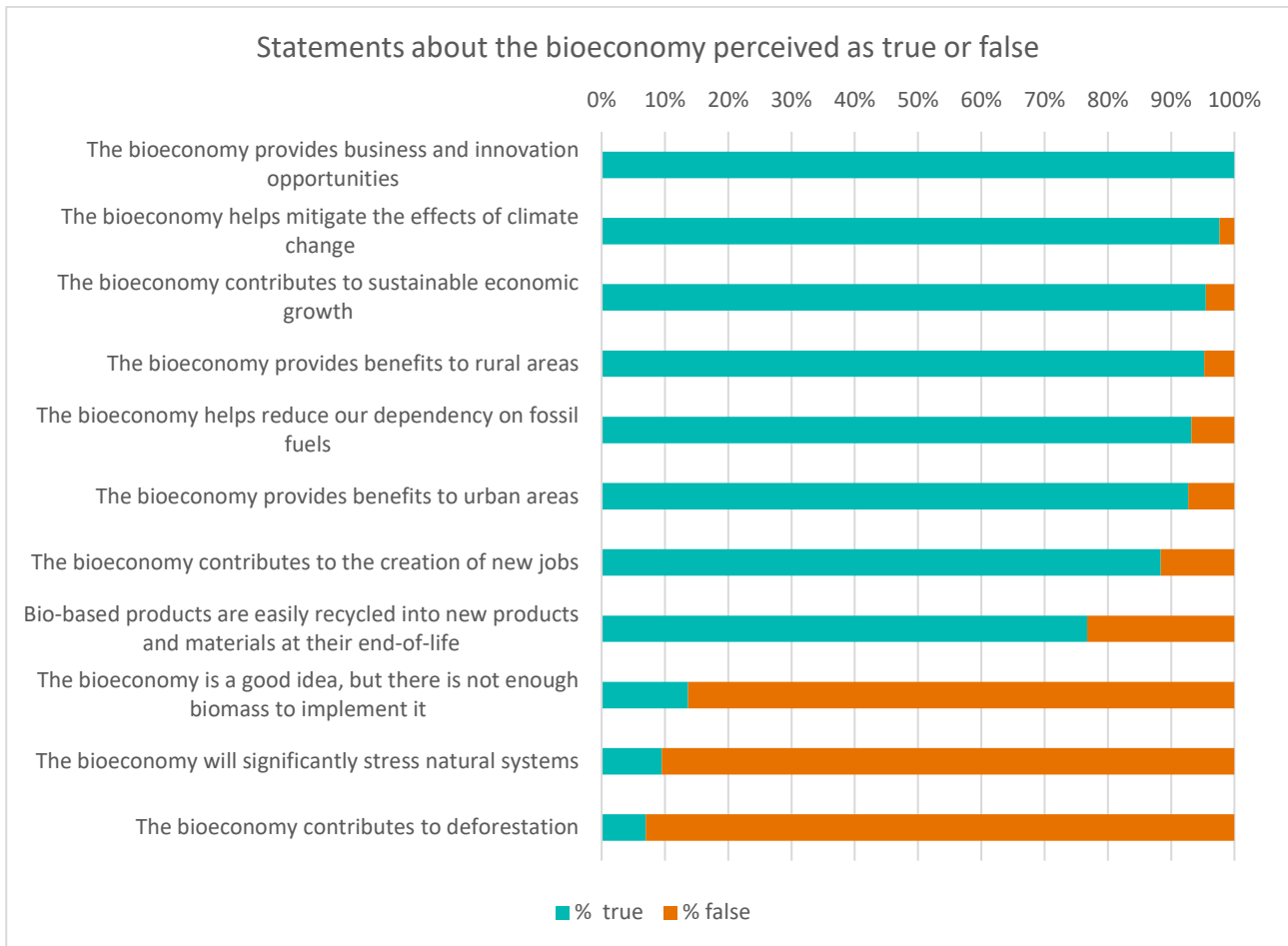


Figure 4: Proportion of survey respondents that marked bioeconomy statements as true (blue) or false (orange). Proportion is expressed as percentage of respondents.

When asked about the single most important benefit of the bioeconomy, *Providing renewable alternatives to non-renewable materials* (32%) emerges as the most frequent answer, followed by *Reduced material consumption and waste, increased reuse and recycling* (20%), *Transition to a low-carbon economy* (16%) and *Helping conserve biodiversity and ecosystem services* (14%) (Figure 5). The benefits *Job creation and economic growth* (5%), *Renewable energy to replace fossil fuels* (5%), *Providing wellbeing for people* (2%) and *Fostering technological innovation* (0%) received very little or even no acknowledgement as most important benefit. 7% of respondents replied that none of the predefined benefits is the most important.

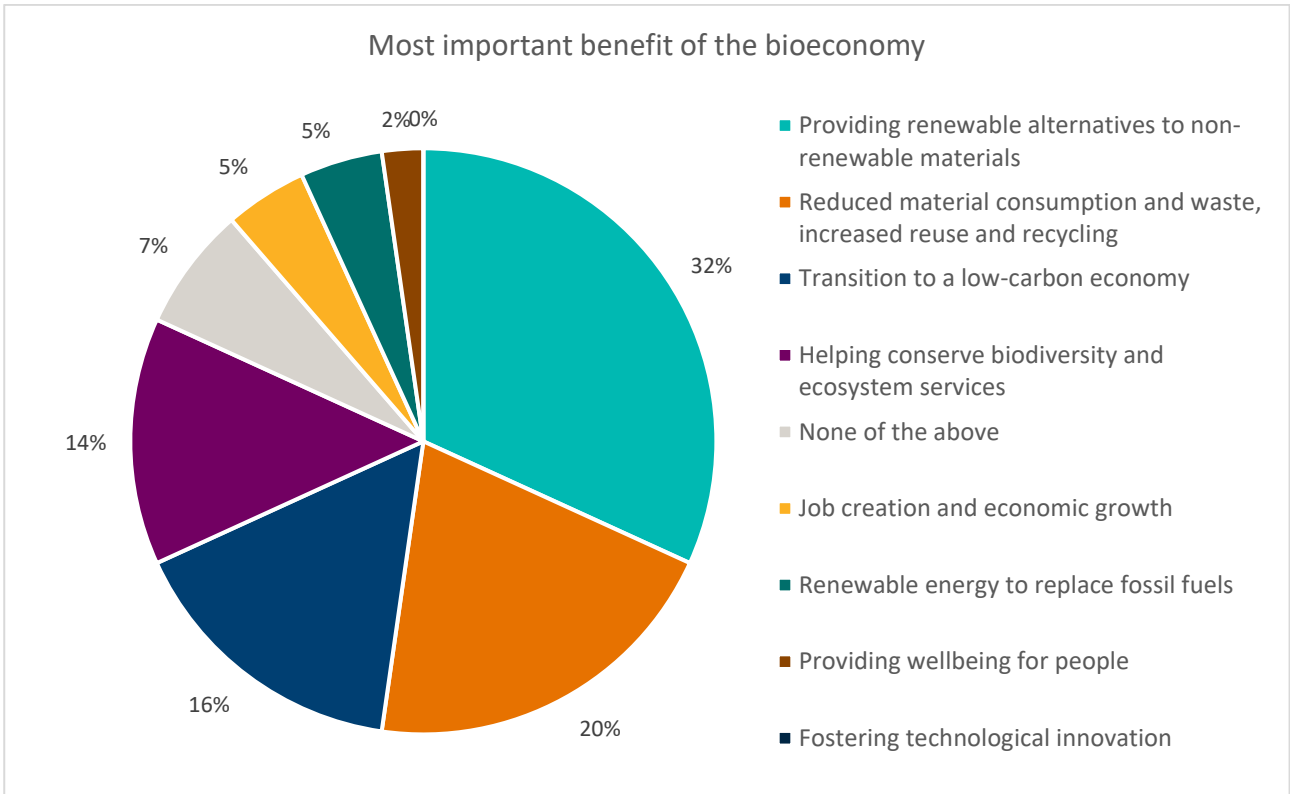


Figure 5: Proportion of respondents that perceived benefits of the bioeconomy as being the most important benefit out of eight predefined benefits. Respondents were limited to select only one benefit. Proportion is expressed as percentage of respondents.

When asked about the single most important risk of the bioeconomy, *Not enough biomass to supply the bioeconomy* (28%) emerges as the most frequent answer, followed by *Impacts on ecosystem services* (16%), *Higher cost of essential goods (e.g., food, water, shelter)* (14%) and *Increasing biomass costs* (12%) (Figure 6). Another 16% of respondents indicated that none of the predefined risks is the most important. Fewer respondents considered *Impacts on poverty or food sovereignty* (7%) and *Dangerous impacts on developing countries* (7%).

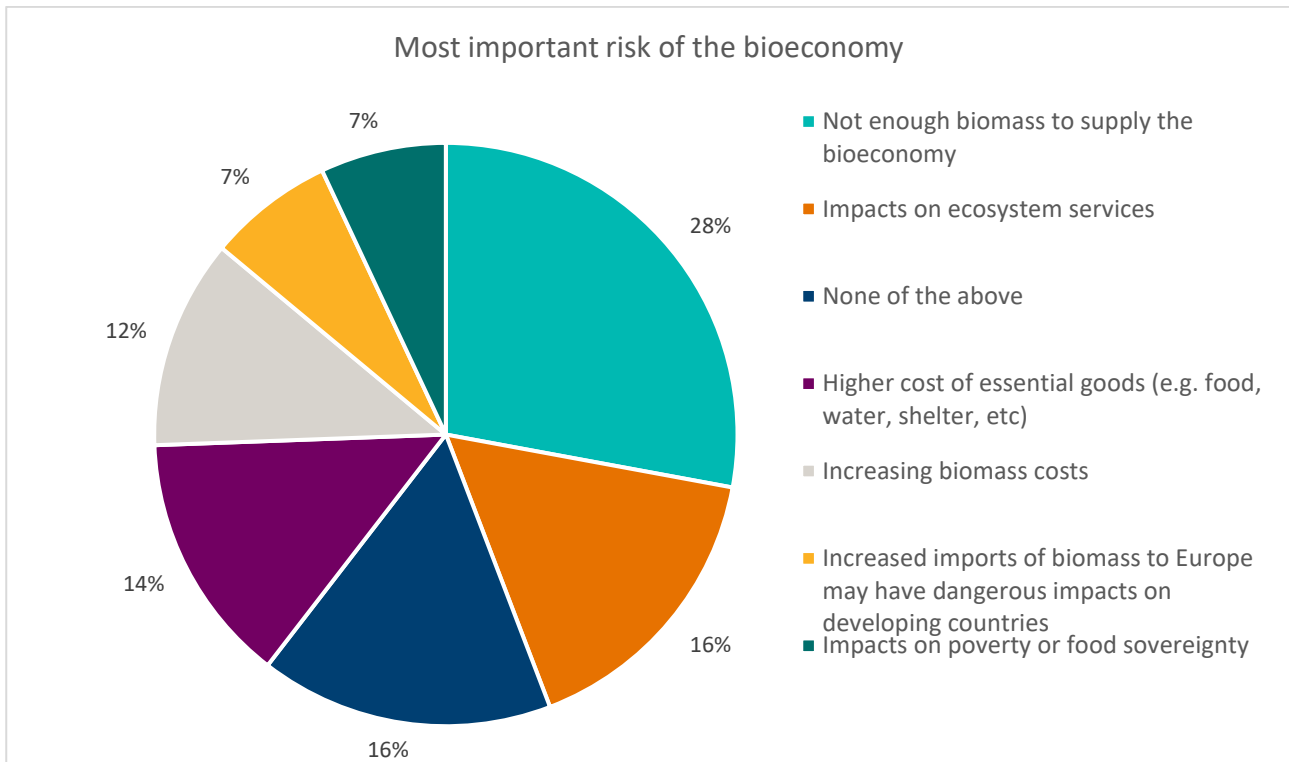


Figure 6: Proportion of respondents that perceived risks of the bioeconomy as being the most important risk out of six predefined risks. Respondents were limited to select only one risk. Proportion is expressed as percentage of respondents.

When asking about public awareness, all respondents (100%) felt that the general public was not sufficiently informed on the bioeconomy.

### 3.3. Revisit communication strategies and value chain priorities

Respondents were asked how prepared their region is for the transition from a conventional economy to a circular bio-based economy, to indicate which bioeconomy sectors have the highest potential for growth, and to what extent different sectors could replace their conventional materials with bio-based materials in the region by 2050. The responses allow to revisit value chain priorities and related communication efforts, compare with current bioeconomy sectors and compare with bioeconomy strategies.

When asking the respondents how they consider the readiness of the Basque Country for the transition from a conventional economy to a circular bio-based economy, over half of the respondents answered low (36%) or very low readiness (17%), while only 12% of respondents consider a high readiness. None of the respondents (0%) considered a very high regional readiness to transition to a circular bio-based economy (Figure 7 **Error! Reference source not found.**).

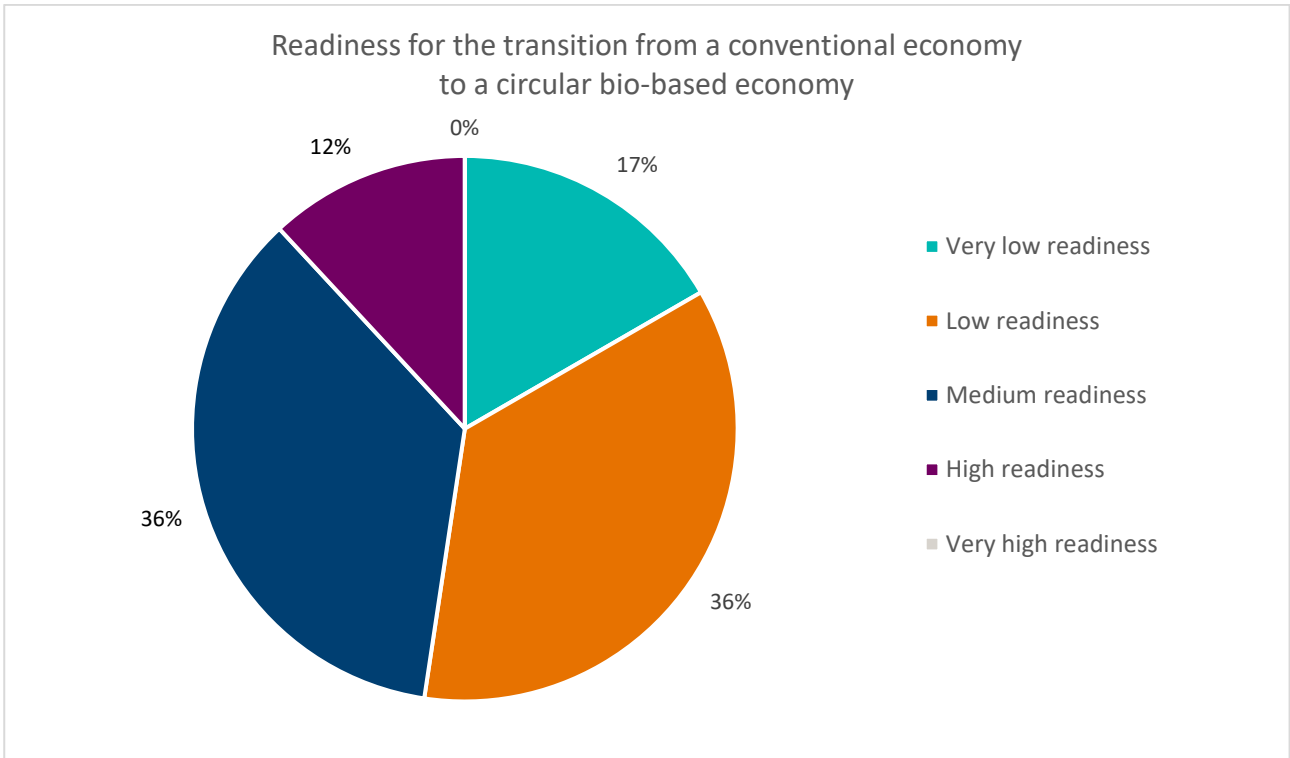


Figure 7: Proportion of respondents that consider different readiness levels of the Basque Country to transition from a conventional economy to a circular bio-based economy.

Respondents perceived that *Bioenergy* (63%) is the bioeconomy sector with highest potential for growth in the Basque Country, followed by *Wood construction* (51%) (Figure 8). *Green chemistry* (37%), *Advanced new materials* (37%), *Food and gastronomy* (30%), *Bioplastics* (26%) were considered sectors with a high potential by a moderate number of respondents. *Wood products* (19%) and *Pulp & paper* (14%) were less considered to have high potential for growth in the Basque Country (Figure 8). *Nature-based tourism* (9%), *Non-wood forest products* (5%) and *Textiles & fashion* (5%) were least considered to have high potential for growth.

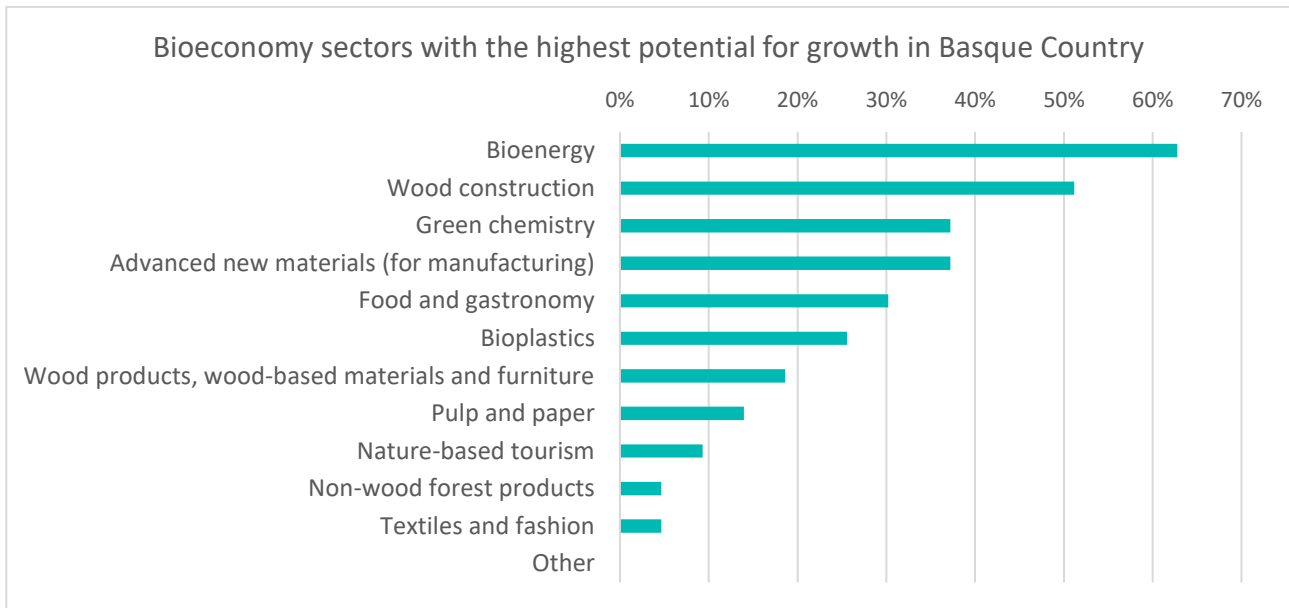
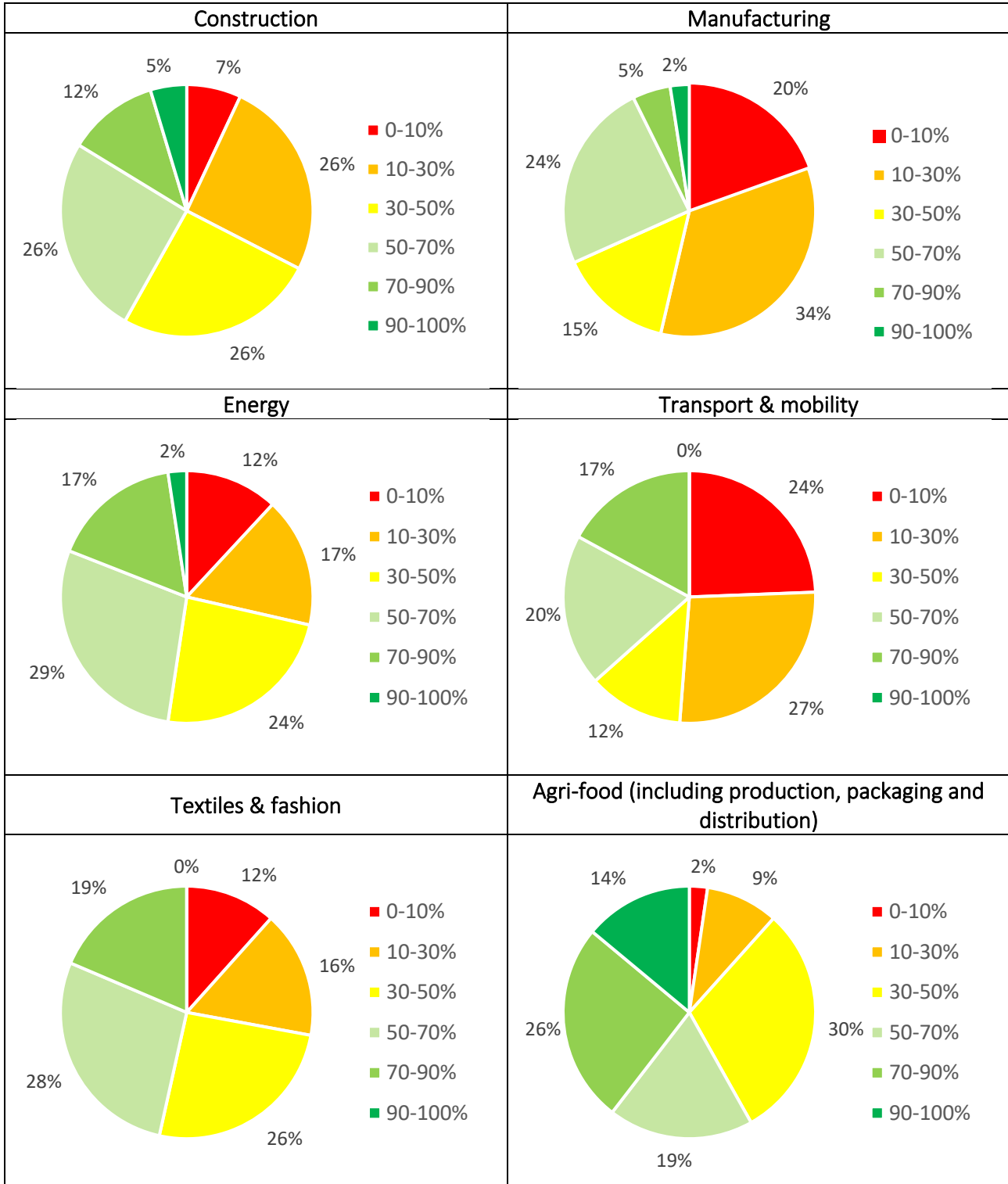


Figure 8: Proportion of respondents that selected bioeconomy sectors to have the highest potential for growth in the Basque Country. Respondents were allowed to choose up to three sectors. Proportion expressed as percentage of respondents.

Respondents were asked to what extent six different sectors could replace their conventional (fossil-based) materials with bio-based materials by 2050 in the Basque Country. Table 1 shows that the majority (more than 50%) of respondents considered that within the sector *Agri-food*, more than 50% of the conventional materials/resources (50-70%, 70-90% and 90-100%; the three green parts in the pie chart) can be replaced with bio-based materials in 2050 in the Basque Country.

By using the average values in the ranges of predefined proportions (e.g., assuming that respondents who selected 10-30% believe on average that about 20% of the conventional materials can be replaced), we can estimate an average proportion of the conventional materials that can be replaced with bio-based materials. This exercise gives as result that the *Agri-food* sector is on average estimated to be the sector with highest potential to replace conventional resources with bio-based resources in 2050 in the Basque Country, namely 59% of resources is estimated to be replaceable. The following sectors with highest proportion of resources that can be replaced are the *Energy* sector (estimated at 46.2% of resources replaceable), *Textiles & fashion* sector (47.5%) and the *Construction* sector (44.8%). The Basque sectors that are expected to have lowest proportion of resources to be replaceable by 2050 are *Transport & mobility* and *Manufacturing*, which are estimated to have respectively 36.8% and 34.5% of their conventional resources replaced with bio-based resources.

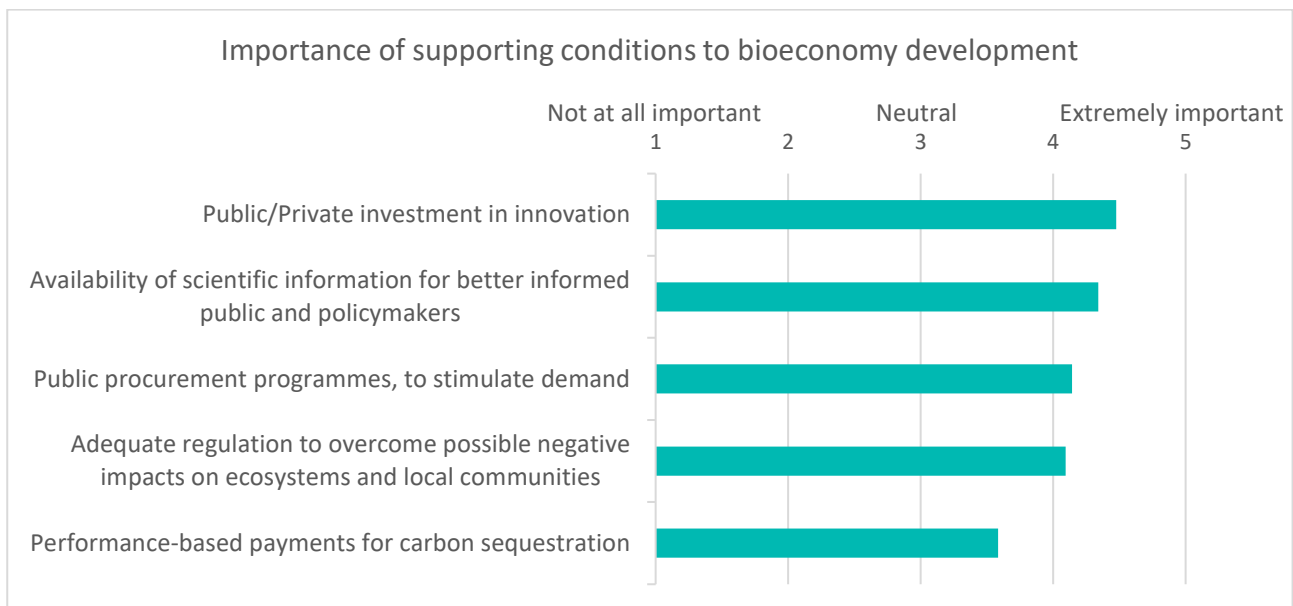
**Table 1: Proportion of respondents that considers the extent to which conventional materials can be replaced with bio-based materials by 2050 in six different sectors in the Basque Country. Respondents were asked to estimate the proportion that can be replaced, choosing from six options: 0-10%; 10-30%; 30-50%; 50-70%; 70-90%; 90-100%.**



### 3.4. Identify barriers & supporting conditions

Respondents were asked to indicate the importance of supporting conditions and barriers for bioeconomy development in the Basque Country. This information allows to ensure that the most important supporting conditions are met and to strategise about how to overcome barriers for bioeconomy development.

*Investment in innovation* (4.48/5) was considered as the most important supporting condition for bioeconomy development, closely followed by *Availability of scientific information* (4.34/5) (Figure 9 **Error! Reference source not found. Error! Reference source not found.**). *Public procurement programmes* (4.14/5), *Adequate regulation* (4.10/5), and *Performance-based payments for carbon sequestration* (3.59/5) obtained scores close to or slightly below Important (4/5).



**Figure 9: Importance of factors as supporting conditions for bioeconomy development in the Basque Country.** Respondents were asked to rank the factors from one (Not at all important) to five (Extremely important), the average value of the respondents' ranking is shown.

Three of the barriers were perceived to be more important than the others, namely *Lack of profitability and market demand* (4.17/5), *Lack of co-operation among different stakeholders* (4.12/5) and *Lack of supportive policy and legislative environment* (4.12/5) (Figure 10 **Error! Reference source not found. Error! Reference source not found.**). With their average scores slightly above 4, they're perceived Important. The other two barriers are ranked in between Neutral (3) and Important (4): *Lack of technical feasibility and/or barriers to innovation* (3.74/5), *Lack of balance between different uses of forest* (3.71/5), and *Lack of general social acceptance* (3.48/5).

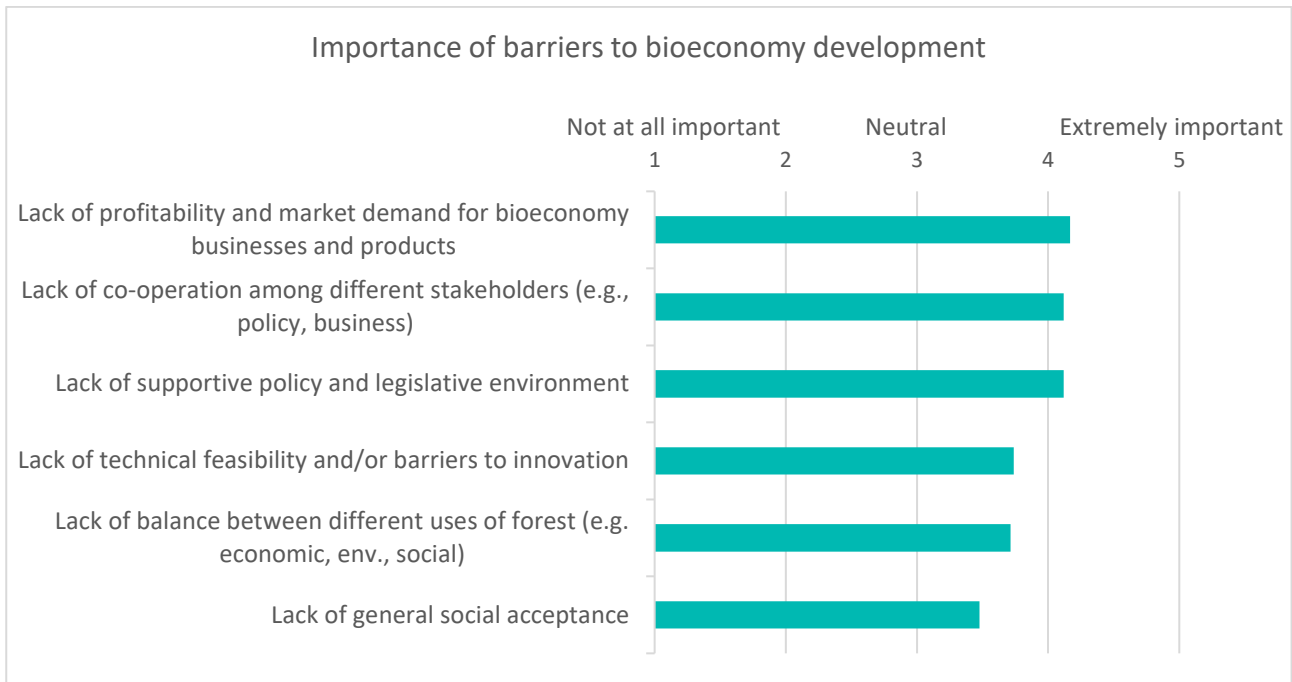


Figure 10: Importance of factors as barriers for bioeconomy development in the Basque Country. Respondents were asked to rank the factors from one (Not at all important) to five (Extremely important), the average value of the respondents' ranking is shown.

### 3.5. Assess “willingness to engage” with the bioeconomy

Respondents were asked how willing their industry sector or government department would be to developing the bioeconomy; if they had been involved in any investment projects, regulation or initiatives related to the bioeconomy; and what were the main reasons for involvement or the lack of it. Below we present the results of government and industry side by side.

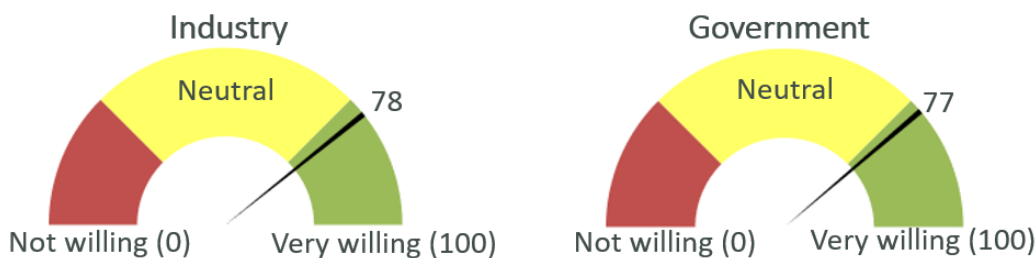


Figure 11: Willingness to develop the bioeconomy. Industry and government respondents were asked to rate how willing their industry sector/government department is to develop the bioeconomy on a scale from zero (not willing) to hundred (extremely willing).

#### Industry

Industry respondents were asked how willing they were to develop the bioeconomy on a scale from zero (not willing) to hundred (extremely willing). The average score was 78, meaning that the industry respondents have a strong willingness to develop the bioeconomy (Figure 11). Moreover, 87% of industry respondents said to have undertaken an investment project in the bioeconomy in the past.

The main reasons to have undertaken bioeconomy investment projects are *To take advantage of the existing market opportunities* (55% of industry respondents that have undertaken bioeconomy projects)



and *To gain a competitive advantage in future markets* (45%). Only one industry respondent that has undertaken bioeconomy projects (5%) selected the pre-defined reason *To take advantage of government incentives*. Two industry respondents (10%) selected *Other* reasons and specified “for the use of by-products” and “to minimise the impact of their products”.

Two of the industry respondents that have not undertaken an investment project in the bioeconomy selected the main reason for it. One (50%) of them selected that *Lack of technical capacity* was the main reason and the other one (50%) selected *Unprepared market: too small and growing too slow* and *High uncertainty in bioeconomy projects* as the main reasons. The other predefined reason *Low expected profitability* was not selected by any of the respondents.

### Government

Government respondents were asked how willing they were to develop the bioeconomy on a scale from zero (not willing) to hundred (extremely willing). The average score was 77, meaning that industry and government respondents reported an equally high willingness to develop the bioeconomy (Figure 11 **Error! Reference source not found.**). Moreover, 88% of government respondents said to have undertaken a bioeconomy regulation or initiative in the past. Again, this number is more or less equal to the comparable answer from industry side.

The main reason to have undertaken a bioeconomy regulation or initiative is *To generate markets and social acceptance of bioeconomy products* (71% of government respondents that have undertaken a bioeconomy regulation or initiative). This is interesting considering that lack of general social acceptance was considered the least important barrier for bioeconomy development in the Basque Country (See section 3.4, Figure 10). Another important reason to have undertaken a bioeconomy regulation or initiative is *To improve availability and access to biological resources* (57%). The reason *To ensure sustainability or social equity* was selected by only one government respondent that had undertaken a bioeconomy regulation or initiative (14%).

There was only one government respondent who reported to NOT have undertaken a bioeconomy regulation or initiative and reported the *Lack of technical capacity* as the main reason. All other predefined reasons were not selected: *Regional development plans do not promote the bioeconomy*, *High uncertainty of bioeconomy outcomes*, *It is not in the best interest of local strategies and policies* and *Public is not asking for this*.

#### **Highlight**

*Both Government and Industry report an equally high willingness of their department or sector to develop the bioeconomy, this could be the foundation for a future strengthened collaboration and co-operation among different stakeholders (e.g., policymakers, business, research) which was perceived an important barrier for bioeconomy development in the Basque Country (see Section 3.4).*

### 3.6. Improve collaboration with government & industry

Respondents were asked about the division of roles and responsibilities between the government and industry regarding communicating the bioeconomy to the public, investing in research, development, and innovation, and ensuring that the bioeconomy has a positive effect on the environment and the society. We compared results between three sub-groups of respondents, namely government, industry and

others (respondents that identified themselves as not being part of government or industry but rather of another field).

All three groups emphasised that the government is more responsible in communicating and promoting the bioeconomy among the general public (Figure 12 **Error! Reference source not found.**). Government respondents signalled a very strong government responsibility to raise awareness while industry and other respondents gave slightly more responsibility to the industry for communicating and promoting the bioeconomy among the general public. Regarding investments in research, development, and innovation, the three sub-groups of respondents perceived that Government and Industry respondents are roughly equally responsible. In relation to ensuring positive environmental and social impacts, government and other respondents indicated that government and industry are roughly equally responsible while the industry respondents signalled a slightly higher responsibility for the government.

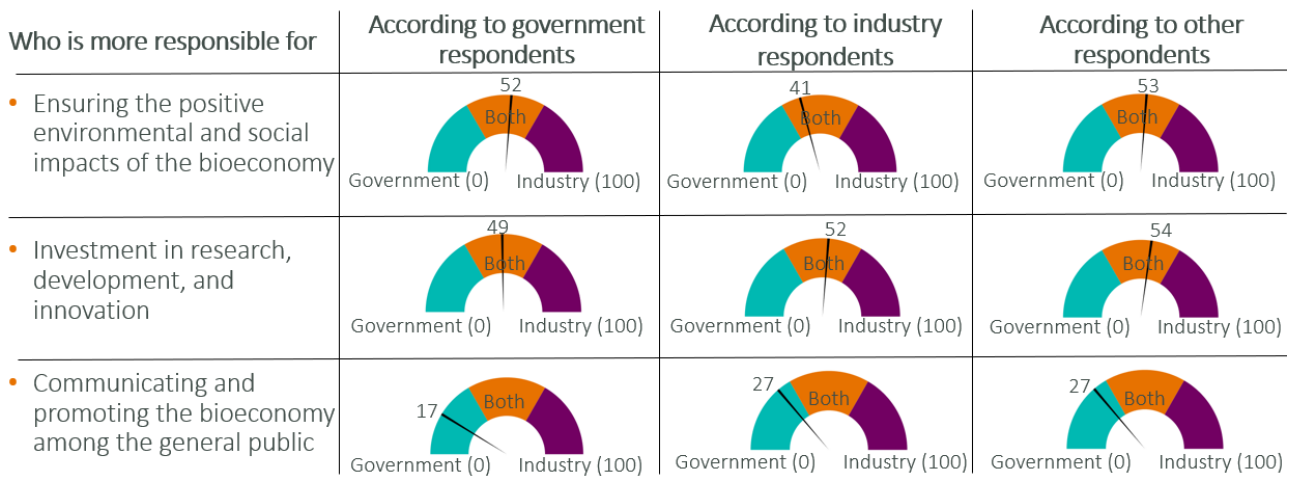


Figure 12: Division of roles and responsibilities between the government and industry regarding three different tasks in moving the bioeconomy in the Basque Country forward. Industry and government respondents were asked to indicate who is more responsible for the three different tasks on a scale from zero (Only government responsible) to hundred (Only industry responsible).

### 3.7. Find key leverage points for bioeconomy development by identifying overlaps with other policy areas

Respondents were asked to identify any overlaps between the bioeconomy and other policy areas that are important to business and government to help the Basque Country identify key leverage points for bioeconomy development in the region. It also expands our understanding of what kinds of goals are seen as important for the bioeconomy.

*Circular economy* was selected by 95% of respondents as having goal alignment with the bioeconomy, followed by *Technological innovation* (90%) (Figure 13). Other policy areas with very high overlap with bioeconomy are *Clean energy* (85%), *Climate change mitigation and adaptation* (83%), *Rural development* (83%). *Biodiversity conservation* (68%) and *Job creation* (55%) were also perceived by more than half of the respondents to have goal alignment with the bioeconomy.

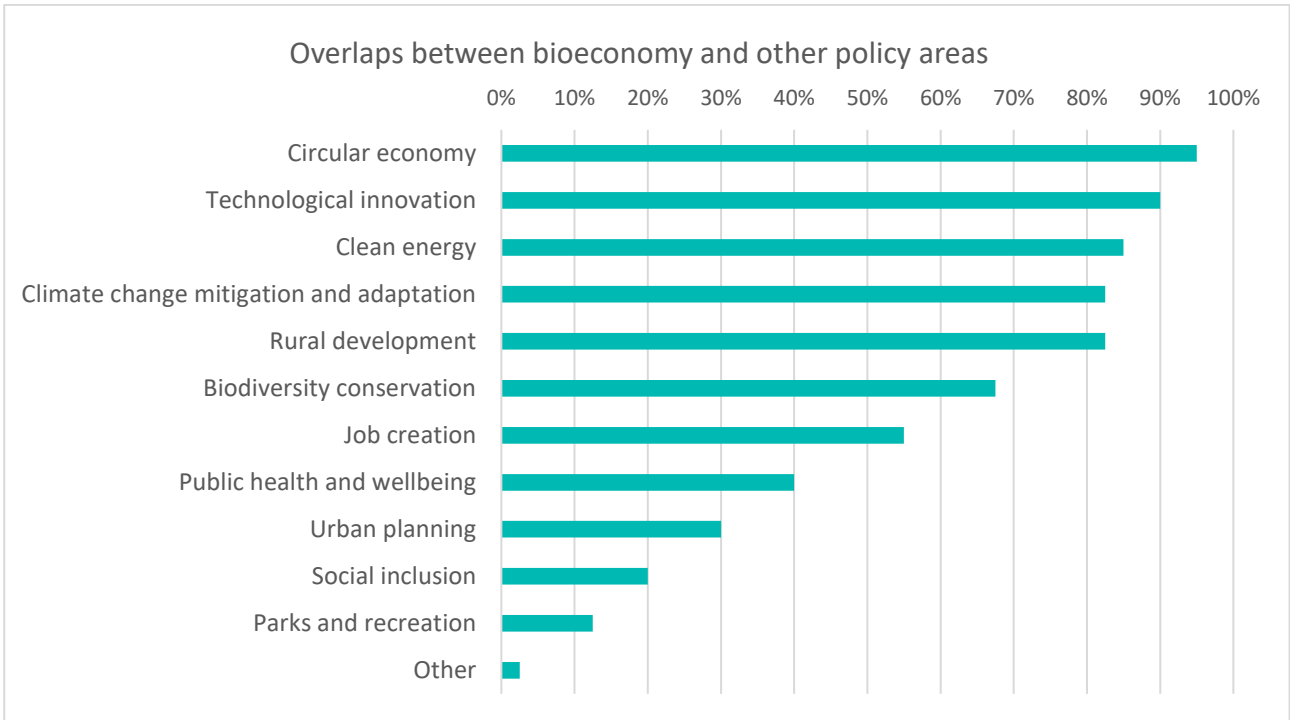


Figure 13: Proportion of respondents that understand certain policy areas to be related with the aims of the bioeconomy. Respondents were allowed to select as many policy areas as desired. Proportion expressed as percentage of respondents.

## 4. Conclusions

With a total of 49 responses, of which 22% from Government (or related public sector), 65% from Industry (or related private sector) and 12% from respondents that identified themselves as not being part of government or industry but rather of another field, the survey results give an insight into how mid-to-high ranking government officials and local industry leaders perceive the bioeconomy, its benefits, and its challenges, in the Basque Country. What we learn about the perceptions of these different groups can be essential to help prioritise regional bioeconomy actions and communications to maximise their impacts. Here we present eight key messages from the Survey.

### **Bioeconomy is highly linked to circularity, sustainable land management and use of biomass for multiple purposes.**

Respondents consider circularity, sustainable land management, and the use of biomass for multiple purposes to be an integral part of the bioeconomy. Carbon neutrality, nature-based solutions, and sustainable consumption were also understood by more than two-third of respondents to be part of the bioeconomy. On the other hand, community resilience, economic prosperity and technological development were less considered to be part of the bioeconomy by the respondents.

### **Bioeconomy is perceived to have a great potential to address environmental challenges, its potential to economic growth appears less prominently.**

Business and policy respondents generally perceived bioeconomy as a promising economic model, highly agreeing on its positive impacts and disagreeing on its potential negative impacts. Bioeconomy is perceived specifically promising to address environmental challenges, with clear emphasis on its contributions to renewable materials, reduced carbon emissions and circularity. Conservation of biodiversity & ecosystem was also considered an important benefit of the bioeconomy. Although respondents do consider that the bioeconomy provides socio-economic benefits such as contributing to economic growth and the creation of new jobs, these benefits appeared less prominently as being most important. Summarising, respondents generally see the bioeconomy as strategic for generating environmental benefits, while also producing some positive economic outcomes, like sustainable economic growth and job creation.

### **All government and industry respondents agreed that the public is not sufficiently informed on the bioeconomy.**

All respondents (100%) think that the general public in the Basque Country is not sufficiently informed on the bioeconomy. This highlights a clear need for communication and awareness raising among the general public.

### **Bioenergy is considered the most promising bioeconomy sector in the Basque Country. Wood construction is also considered to be promising, followed by Green chemistry and Advanced new materials.**

Respondents perceive the bioeconomy to be highly linked to agriculture and forestry, and somewhat less to fisheries and aquaculture. Respondents do perceive it to be very linked to waste processing and slightly less to industrial biotechnologies. Among downstream sectors, bioenergy is perceived by-far the bioeconomy sector with highest potential for growth in the Basque Country, followed by Wood construction. This might be a reflection of the Basque government's efforts to make wood construction more visible in the region, e.g., through the support to the biannually International Forum of Architecture & Construction in Wood, called Egurtek (see context). Green chemistry and Advanced new materials (for manufacturing) were also considered to be sectors with a high potential. Nature-based tourism, non-

wood forest products and textiles & fashion were least considered to have potential for growth in the Basque Country.

**Biologisation of existing sectors is perceived to be significant by 2050 in the Basque Country.**

Respondents believe that all six sectors, for which the information was asked, can replace significant proportions of their conventional (e.g., fossil-based) materials by bio-based materials by 2050 in the region, estimated proportions ranged from 35% to 59%, depending on the sector. The sectors with highest potential for biologisation (replacing conventional materials by bio-based materials) are Agri-food, Energy and Construction. The emphasis on Energy and Construction sectors to be biologised coincides with the perceptions that bioenergy and wood construction have the highest potential for growth in the region.

**Investment in innovation and availability of scientific information are perceived as a key enablers of the bioeconomy; Lack of profitability & market demand for bioeconomy, limited co-operation among different stakeholders (policy, business, etc.), and lack of supportive policy & legislative environment are considered the most important barriers.**

Two supporting conditions (enablers) for the bioeconomy development in the Basque Country were rated more important than the others, namely investment in innovation and availability of scientific information for better informed public and policymakers. Public procurement programmes and adequate regulation, both referring to the role of public administration, were also considered important supporting conditions. There are three barriers perceived in between important and extremely important for bioeconomy development in the Basque Country: Lack of profitability & market demand for bioeconomy businesses and products; Limited co-operation among different stakeholders (policy, business, etc.); and Lack of supportive policy & legislative environment. Lack of general social acceptance was considered the least important of the predefined barriers (still with a score in between Neutral and Important).

**Circular economy, technological innovation, clean energy, climate change mitigation & adaptation and rural development are the key policy areas perceived to have the strongest goal alignment with the bioeconomy.**

Basque business and policy actors suggest that bioeconomy has strong goal alignment with circular economy, closely followed by technological innovation. Also, several environment-related policy areas are perceived to have strong goal alignment: clean energy; climate change mitigation and adaptation; and biodiversity conservation. Another policy areas with high overlap with bioeconomy is rural development. Job creation was also considered to have high overlaps with the bioeconomy by more than half of the respondents. Bioeconomy was considered by less than half of respondents to have goal alignment with urban planning, recreation, health & wellbeing, and social inclusion.

**Government and industry indicate high willingness to engage with the bioeconomy and are well aligned in their perceptions on the responsibilities.**

Both government and industry respondents indicated that their sector or department is willing to develop the bioeconomy. In addition, government and industry respondents felt very similar about who is responsible for different tasks in moving the bioeconomy in the Basque Country forward. Both groups indicated that they are more or less equally responsible for investments in research, development, and innovation. While the industry respondents gave a slightly higher responsibility to the government for ensuring positive environmental and social impacts, the government respondents indicated a more equal responsibility in between government and industry. Both groups agree that government is significantly more responsible for communicating and promoting the bioeconomy among the general public with government respondents putting more emphasis on the government's responsibility.

## 5. About the Bioregions Facility and the survey

The Bioregions Facility, launched in 2020, is a transregional cooperation network that supports innovation, networking, and policy learning related to the development of a sustainable forest bioeconomy. Consisting of forward-thinking regions across Europe, it aims to unlock regional potential through international exchange on forest circular bioeconomy issues. The three founding members are the Basque Country (Spain), North Karelia (Finland) and North Rhine-Westphalia (Germany), with the European Forest Institute holding the Secretariat for the facility.

The Bioregions Facility seeks to support regional level policymakers to take advantage of strong regional policy tools and global best practices, create mutually beneficial partnerships with the private sector, and deeply understand the unique regional challenges and supporting conditions for the bioeconomy. The bioeconomy perceptions survey is an important part of this work, and it will be replicated in all the Bioregions member regions and beyond with the aim of gathering insights from regions across Europe for a large-scale comparative study.

Target outcomes of the Bioeconomy Perceptions Regional Survey:

- Understand how business and policy actors perceive the bioeconomy
- Revisit value chain priorities and related communication efforts
- Identify barriers & supporting conditions
- Assess “willingness to engage” with the bioeconomy
- Improve collaboration with government & industry
- Find key leverage points for bioeconomy development by identifying overlaps with other policy areas

## 6. Survey methodology

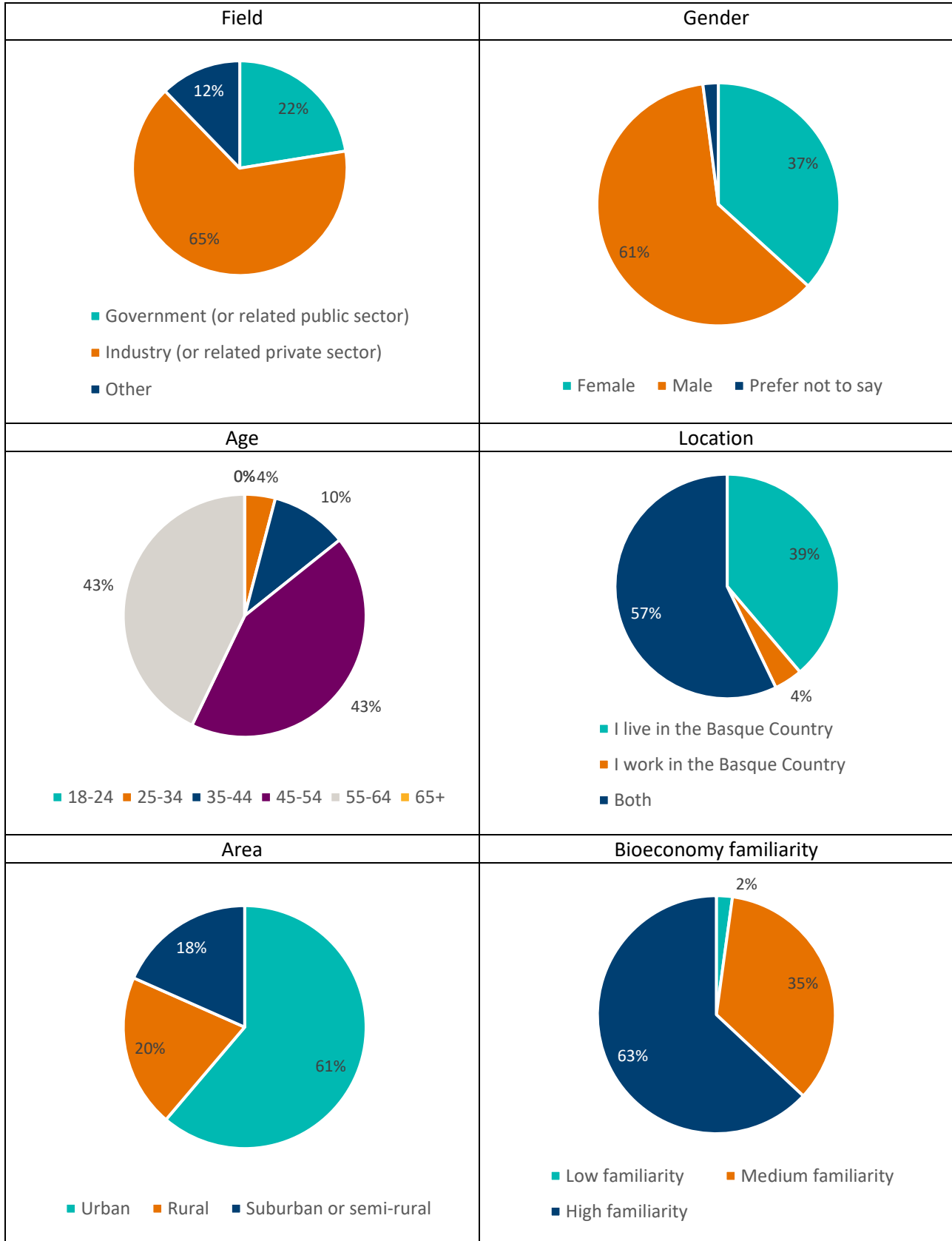
The Survey is provided in the form of a toolkit to a regional partner organisation that takes care of identifying and contacting potential respondents. The toolkit is designed and adapted to the regional context by the Bioregions Facility. Consequently, the regional partner organisation is able to launch and disseminate the Survey in the region at their own pace, with support of the Bioregions Facility Secretariat.

The Survey toolkit consists out of 5 items: 1) Deployment checklist and timetable; 2) Pamphlet on goals and expected outcomes; 3) Survey invitation email; 4) Survey pre-formatted in SurveyMonkey; 5) Guide for identifying and contacting survey participants. All materials reaching the potential respondents are adapted to the local language, in this case a bilingual survey in Spanish and Euskera (Basque). The Deployment checklist and timetable document serves to keep track of responsibilities and timelines. The Guide for identifying and contacting survey participants defines in more detail how to identify survey target groups and what to consider in the survey launch and dissemination stages.

After the closure of the Survey, the Bioregions Facility Secretariat takes the lead in creating three deliverables. These include a report on the results (this document), a PowerPoint with summarised results and a social media kit with a number of social media cards. The report includes a section on the Regional context and a section with Conclusions & recommendations. The regional partner organisation is closely involved in the writing of those two sections.

In the case of the Basque Country, the Basque government identified target participants from government and industry and disseminated the survey. The Bioeconomy Perceptions Regional Survey was open to answers during the period April - July 2022 and the analysis and report writing took place between September-October 2022.

## A1. Characterisation of the respondents





## A2. Survey questions

[Survey pre-formatted in SurveyMonkey: English translation](#), (REGION) is in this case always replaced with Basque Country

[Survey pre-formatted in SurveyMonkey: Spanish](#)