



Promoting stakeholder engagement and public awareness  
for a participative governance of the European bioeconomy



## Results of the BioSTEP stakeholder consultation

March 2016

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## EXECUTIVE SUMMARY

The main aim of the BioSTEP stakeholder consultation was to provide insights on existing (policy) challenges for the European bioeconomy and potential (policy) measures to address them. The results inform the design of three policy workshops, which BioSTEP will organise in 2016. The outcome of this process will be a list of targeted policy recommendations for the (further) development of balanced and informed bioeconomy strategies at the regional, national and European levels.

During the period of 30 October to 22 December 2015, more than 180 stakeholders from a broad spectrum responded to the BioSTEP consultation. The two largest stakeholder groups involved in the consultation were universities/research centres and government representatives, accounting for roughly half of the stakeholders. The about 30 respondents from industry and SMEs are regarded as a satisfactory contribution of the private sector to the BioSTEP survey.

**Section 1** of the consultation addressed “Benefits and challenges of the bioeconomy”. The strongest stakeholder agreement on ***perceived benefits*** was indicated for “managing natural resources sustainably”, thus placing the importance of the bioeconomy in a wider societal context. This fact is also underlined by the strong agreement with the benefits “Supporting investment in new infrastructures” and “Supporting investment in knowledge, innovation and skills”. The contribution of the bioeconomy to “reducing dependence on non-renewable resources” and to “mitigating and adapting to climate change” was seen more critically. This may be due to the on-going discussion on the GHG impacts of biomass production and use and the inherent limitations of biomass availability.

With respect to ***challenges of the bioeconomy*** stakeholders highlighted the importance of “sustainability assurance”, “policy coherence”, “appropriate financing”, and “participative dialogue with the public and bioeconomy stakeholders”. The latter challenge is directly addressed by the EU-funded project BioSTEP with its overall aim to promote a public dialogue on the goals of the bioeconomy and the steps needed to move towards a sustainable economy and way of life. On the other hand, stakeholders expressed limited concerns in the areas “specialist personnel”, “transparent intra-governmental communication”, and “data availability”.

**Section 2** of the consultation addressed “Potential social and environmental impacts of the bioeconomy”. Stakeholders attributed utmost importance to potential negative ***social impacts*** of the bioeconomy on food security. This is fully in line with concerns raised globally on the impacts of increased biomass, bioenergy and biomaterial production. Strong concerns also exist with respect to effective participation and the distribution of revenues created. Social impacts on employment and labour rights, land tenure, health and overall ethical implications raise lower, but still considerable concerns. These topics are usually regarded as less critical in Europe whereas they often trigger major concerns in developing countries. Changes in landscape aesthetics are attributed lowest importance. Finally, several stakeholders stated that all (social) impacts were highly dependent on the type of feedstock with residues and wastes usually having lower potential impact than energy crops grown on agricultural land.

Stakeholders regarded all presented potential ***environmental impacts*** as “important”. Highest concern was attributed to impacts on resource use (land use efficiency, energy efficiency). This is in line with key findings under perceived benefits of the bioeconomy with respect to “managing natural resources sustainably”. Environmental impacts on climate change, water, soil and biodiversity were regarded as “important” in average whereas stakeholders attributed slightly lower importance to air pollution and CO<sub>2</sub>eq emissions due to indirect land use change. The latter may result from ongoing controversies regarding the reliability of methodologies to assess indirect land use change impacts.

**Section 3** of the consultation concerned the evaluation of specific “topics/measures” to address a number of challenges faced by the European bioeconomy. With respect to the **challenge “ensuring sustainability”**, stakeholders underlined the importance of monitoring sustainability performance and incentives to improve sustainability performance. Both measures focus on assistance offered to bioeconomy market players to improve performance rather than on strict regulatory interventions. Such measures would facilitate initial market development with the aim to benefit from “learning by doing” towards continuously improved sustainability performance.

Mandatory sustainability certification was attributed higher importance than voluntary sustainability certification. As voluntary agreements often do not live up to their promises, mandatory measures are regarded as necessary to ensure “minimum” sustainability performance. The low importance attributed to limitations on production volumes is interesting in the light of the recent cap introduced for food based biofuels implemented in the framework of the revision of the EU Renewable Energy Directive (RED) – “ILUC Directive”.

Stakeholders attributed highest importance within the **challenge “ensuring policy coherence”** to integrating bioeconomy strategies into agricultural, environmental, energy, regional, climate and industrial policies. A holistic policy approach integrating several sectors is needed to ensure the success of the European bioeconomy. This holistic policy shall be supported by comprehensive EU Research & Innovations strategies and funding programmes (e.g. Horizon 2020), specific policies promoting the availability of raw materials, and the development of appropriate regulations for the bioeconomy.

Stakeholders attributed slightly lower importance to the development of standards, the adaptation of regional smart specialisation strategies, and the harmonisation of certification and labelling schemes. Finally, stakeholders see public procurement and indicative or binding targets as less appropriate to ensure policy coherence within the European bioeconomy.

With respect to the **challenge “improving intra-governmental communication”**, highest importance was given to establishing multi-level working group(s) made up of central/regional/local government department representatives. Regular inter-departmental meetings, high level working group(s) made up of central government department representatives and the development of better mechanisms for inter-departmental communication were regarded less important. Stakeholders highlighted the importance of agreeing on common targets and the clear identification of a leading department (focal point). Furthermore, as some biomass used in the EU is sourced from non-EU countries, inter-government communication with these countries is important as well.

With respect to the **challenge “promoting a participative dialogue”**, stakeholders attributed high importance to dedicated working group(s) made up of public sector representatives and bioeconomy stakeholders, grant or loan-based financing schemes for public-private initiatives as well as local and regional workshops. Specific stakeholder contributions further highlighted the importance of public-private collaboration to promote and support the market introduction of innovative bioenergy solutions and business models.

Stakeholders underlined the importance of establishing networks of best practice bioeconomy regions in Europe and organising best practice workshops for information sharing within the **challenge “sharing best practice”**.

With respect to the **challenge “ensuring appropriate financing”**, stakeholders attributed highest (and almost equal) importance to building investor confidence in the bioeconomy, promoting public private partnerships, public funding for demonstration projects and funding from national programmes for the bioeconomy. The establishment of a stable, long-term and supportive policy and regulatory framework encompassing policy coherence between different sectors involved and effective sustainability assurance is generally seen as crucial pre-requisite for investor confidence in the bioeconomy. Stakeholders indicated lower relevance for green public procurement and ensuring competitive feedstock costs.

With respect to the **challenge “ensuring appropriate data availability”**, stakeholders attributed highest importance to establishing national Knowledge Exchange Networks to promote information sharing between bioeconomy actors and information resource websites. On the other hand, stakeholders indicated lower relevance with regard to industry fora, unified mailing services, ontologies, taxonomies and Semantic Web or RSS feeds on bioeconomy topics.

Stakeholders highlighted the importance of increased funding for bioeconomy research within the **challenge “ensuring sufficient specialist personnel”**. The education of specialist personnel can also be supported by international exchange programmes for students and entrepreneurs, national (and/or regional) industry skills policies and training programmes, individual grants for specialist education as well as additional funding for educational/training bodies. Stakeholders indicated slightly lower relevance for public information and awareness efforts, clearer vocational and academic qualification pathways and grants to businesses to improve workers' specialist skills.

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## Abbreviations

<b>CAP</b>	Common Agricultural Policy
<b>CEN</b>	European Committee for Standardization
<b>CEO</b>	Chief executive officer
<b>CO<sub>2</sub> (eq)</b>	Carbon dioxide (equivalent)
<b>CSO</b>	Civil society organisation
<b>EFSI</b>	European Fund for Strategic Investments
<b>ETS</b>	Emissions Trading System
<b>EU</b>	European Union
<b>GHG</b>	Greenhouse gas
<b>HCl/HF</b>	Hydrochloric acid/Hafnium
<b>ILUC</b>	Indirect land use change
<b>ISO</b>	International Organization for Standardization
<b>KPI</b>	Key performance indicator
<b>NGO</b>	Non-governmental organisation
<b>NH<sub>3</sub></b>	Ammonia
<b>NO<sub>x</sub></b>	Nitrogen oxide
<b>RED</b>	EU Renewable Energy Directive (Directive (EU) 2015/1513)
<b>ROI</b>	Return on investment
<b>RSS</b>	Rich Site Summary
<b>SBP</b>	Sustainable Biomass Partnership
<b>SDGs</b>	Sustainable Development Goals
<b>SME</b>	Small and medium-sized enterprise
<b>SO<sub>2</sub></b>	Sulphur dioxide
<b>TV</b>	Television
<b>UK</b>	United Kingdom
<b>UN</b>	United Nations

# 1 Aims and objectives of the stakeholder consultation

BioSTEP's main objective is to promote stakeholder engagement and public awareness for a participative governance of the European bioeconomy. The stakeholder consultation was carried out under Work Package 4 of BioSTEP, which aims to engage stakeholders and policy-makers at the European, national and regional levels in debates about the potentials of the European bioeconomy and to outline priorities for the further development and implementation of bioeconomy strategies at the regional, national and European levels.

In this context, the main aim of BioSTEP's stakeholder consultation was to provide insights on existing (policy) challenges related to the bioeconomy and potential (policy) measures to address them. The results of the consultation help the project team to understand how different actors perceive the challenges, opportunities and policy gaps surrounding the development and strengthening of national and regional bioeconomy strategies and inform the design of three policy workshops, which BioTEP will organise in 2016 and 2017. The outcome of this consultation and engagement process will be a list of targeted policy recommendations for the (further) development of balanced and informed bioeconomy strategies at the regional, national and European levels.

This BioSTEP consultation was opened on 30 October 2015 with an initial closing date of 6 December 2015, which was later extended until 22 December 2015.

# 2 Overview of the methodology used

## 2.1 Design of the survey

Besides general information on the respondent (country, type of organisation, sector and field of activity), the electronic survey included **three thematic sections** on "benefits and challenges of the bioeconomy", "potential impacts of the bioeconomy" and "strategies to address challenges", involving a mixture of 16 closed and open-ended questions.

In the first thematic section on "Benefits and challenges of the bioeconomy" (Questions 5 and 6), a number of "statements" were presented for each question and respondents were asked to "value" the statements on a scale of 1 (strongly disagree) to 5 (strongly agree).

- 1: strongly disagree
- 2: disagree
- 3: neutral
- 4: agree
- 5: strongly agree

In the second thematic section on "Potential impacts of the bioeconomy" (Questions 7 and 8) and the third thematic section on "Strategies to address challenges" (Questions 9 to 16), a number of "topics and/or measures" were presented and respondents were asked to "value" these "topics/measures" on a scale of 1 (not important) to 5 (very important).

- 1: not important
- 2: slightly important
- 3: moderately important
- 4: important
- 5: very important

The questionnaire was accessible via EUSurvey (<https://ec.europa.eu/eusurvey/>), the European Commission's official survey management tool. A number of measures were taken to promote the survey among relevant stakeholders. Invitations were sent to more than individual stakeholder contacts that had been identified by the members of the project consortium. In addition, the invitation

was disseminated via a number of newsletters and networks, including the networks of the members of the project's advisory board. Overall, with respect to the mobilisation of stakeholders for this consultation, a great deal of attention was paid to ensuring regional and sectoral balance. The survey was completed by a total of 182 respondents which is a sufficient number allowing meaningful conclusions to be drawn from this survey.

The full questionnaire is presented in Annex 1 of this report.

## **2.2 Collection and interpretation of results**

The results of this online consultation were automatically stored in a coded format which was then interpreted and converted into tables and pie charts in an excel document.

For the main line of evaluation of this questionnaire, a "weighted average score" was calculated for each question. With this weighted average score the "agreement" of stakeholders with a certain statement or the "importance" attributed by stakeholders to certain topics or measures can be evaluated. Furthermore, the "sequence of importance" attributed by stakeholders can be identified and the "most important statements/topics/measures" may be specifically addressed within the upcoming policy workshops organised by BioSTEP in 2016.

### 3 Overview of responses

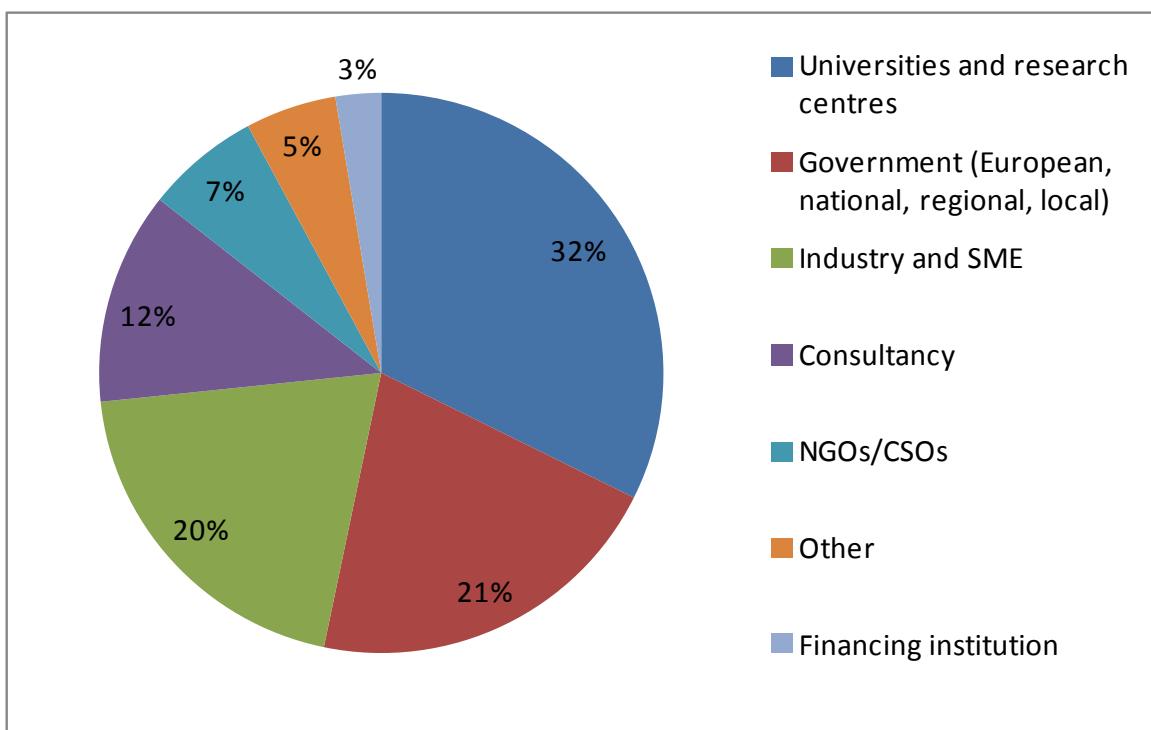
The first part of the BioSTEP questionnaire aimed to provide an overview on general information about the stakeholders responding to the consultation.

#### 3.1 Stakeholder groups / types of organisations represented

Figure 1 shows the types of organisations of stakeholders responding to the BioSTEP consultation ( $n = 229$  from 182 responses due to multiple responses).

The two largest stakeholder groups were universities and research centres and government representatives, accounting for roughly half of the stakeholders. This distribution is rather typical for such online consultations. The 20% of respondents from industry and SMEs are regarded as a satisfactory contribution of the private sector to the BioSTEP survey.

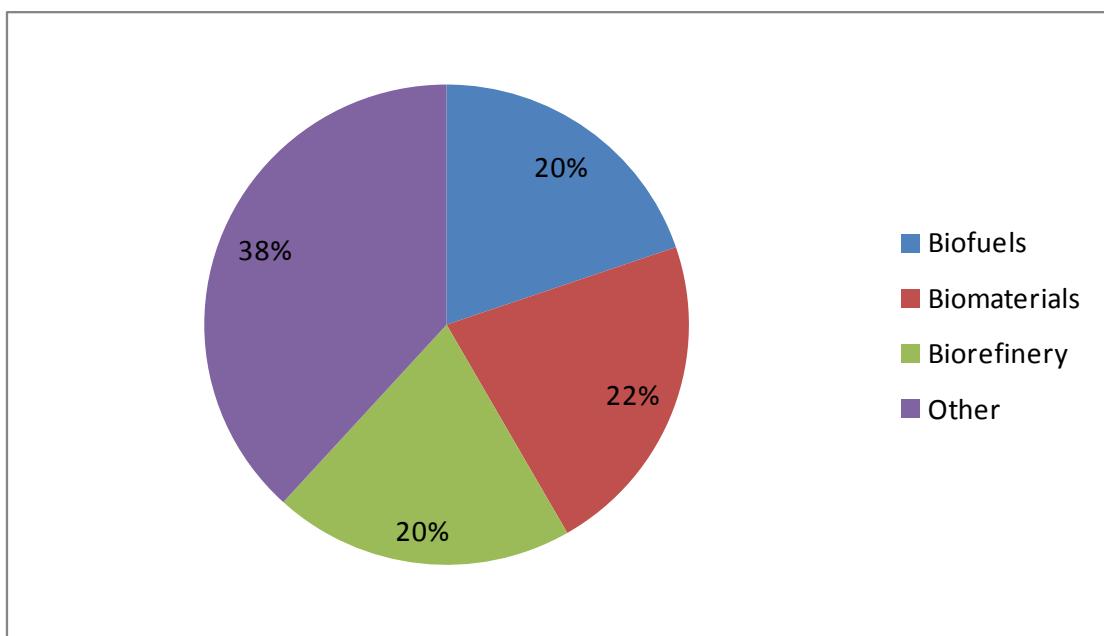
**Figure 1: Types of organisations of stakeholders responding to the BioSTEP consultation**



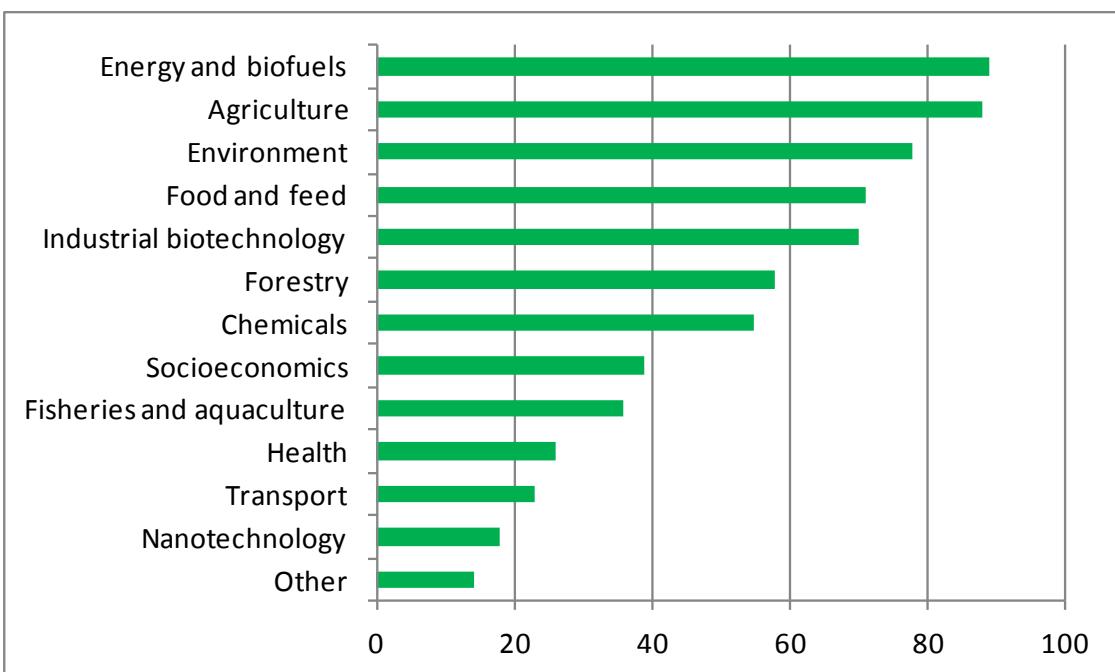
#### 3.2 Sectors represented and field of activity

The sectors represented by survey respondents (see Figure 2) show an equal distribution among the three “choices” of biofuels, biomaterials and biorefinery. Due to multiple responses, the total number of responses is 288 from 182 filled questionnaires.

Noteworthy is the large percentage of “other”, which include forestry, food, environment, pulp and paper, aeronautics, biomass, bioenergy, policy, research, education and innovation and life sciences. It seems thus that stakeholders did not regard the three presented sectors as fully relevant for describing their activities.

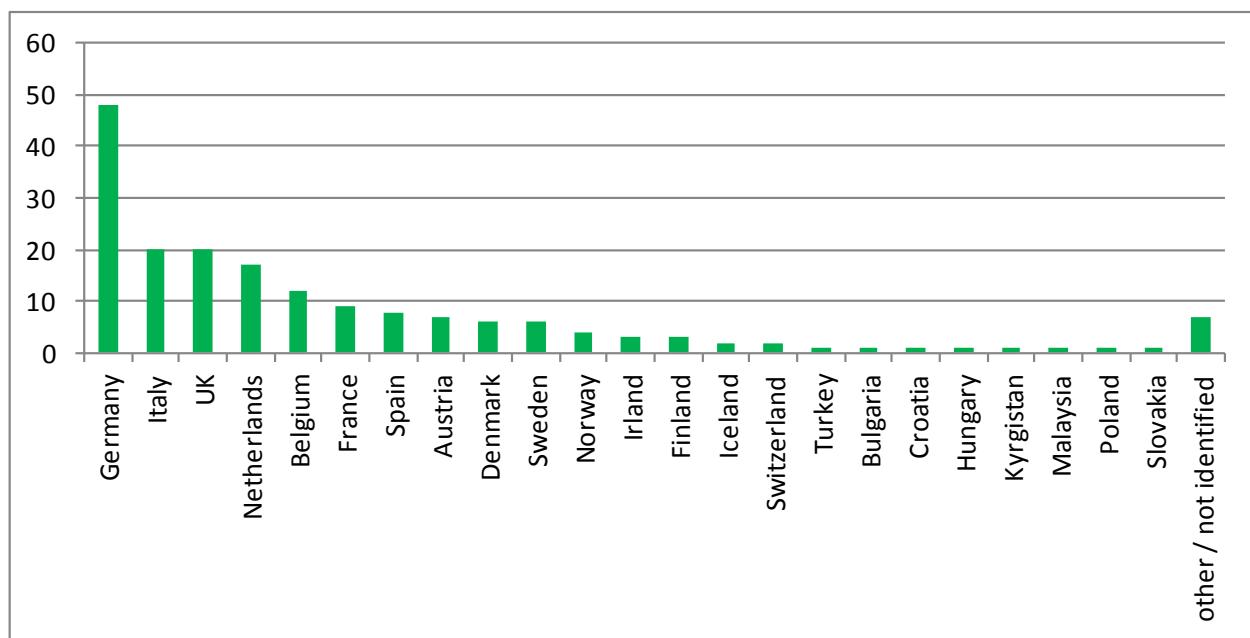
**Figure 2: Sectors represented by respondents to the survey**

A more detailed overview of the respondents' fields of activities is provided below. Multiple answers were possible, which resulted in a total number of 665 responses from 182 filled questionnaires.

**Figure 3: Activities represented by respondents to the survey**

### 3.3 Countries represented

Figure 4 shows the countries where stakeholders do most of their work. Responses were received from 17 EU Member States. Countries with strategies in the area of bioeconomy (e.g. Germany, Italy, UK and the Netherlands) and countries represented in the BioSTEP consortium are overrepresented in this survey ( $n = 182$  from 182 responses).

**Figure 4: Countries where stakeholders do most of their work**

## 4 Survey results

### 4.1 SECTION I – Benefits and challenges

#### 4.1.1 Perceived benefits of the bioeconomy

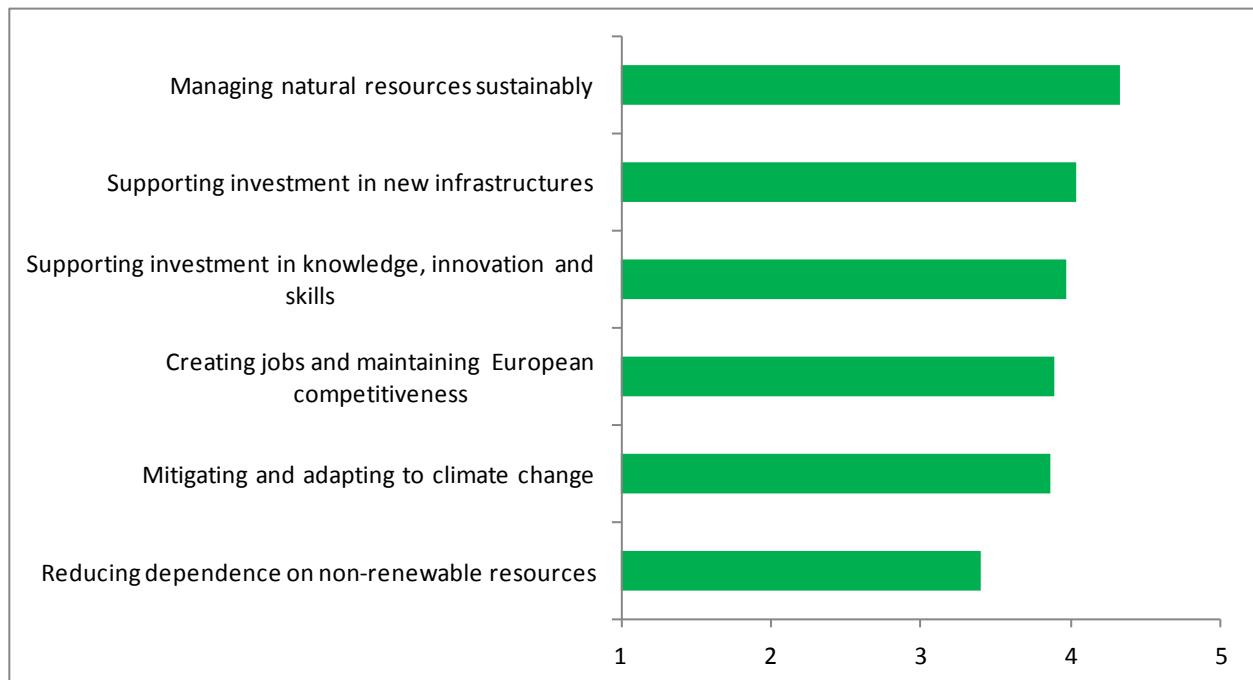
The first thematic section of the survey addressed perceived benefits and challenges of the bioeconomy.

Under Question 5, respondents were asked to indicate their level of agreement on a scale from 1 (strongly disagree) to 5 (strongly agree) to several perceived benefits offered by the bioeconomy.

Figure 5 shows that stakeholders generally agreed with the stated benefits. Strongest agreement was indicated for managing natural resources sustainably, thus placing the importance of the bioeconomy in a wider societal context. This fact is also underlined by the strong agreement with the benefits supporting investment in new infrastructures and supporting investment in knowledge, innovation and skills.

The contribution of the bioeconomy to reducing dependence on non-renewable resources and to mitigating and adapting to climate change was seen as more critical. This may be due to the ongoing discussion on GHG impacts of biomass production and use and the inherent limitations of biomass availability.

**Figure 5: Perceived benefits offered by the bioeconomy (1(strongly disagree) to 5 (strongly agree))**



Question 5 also included the option of indicating additional perceived benefits of the bioeconomy. Stakeholders stated the following main benefits: rural development, food security, energy security, circular economy, and social responsibility.

It is therefore recommended to specifically address sustainable resource management and to include discussion panels on the GHG impacts of the bioeconomy in the upcoming BioSTEP policy workshops. Furthermore, topics such as rural development, food security and the circular economy should be covered in the BioSTEP workshops.

### 4.1.2 Important challenges of the bioeconomy

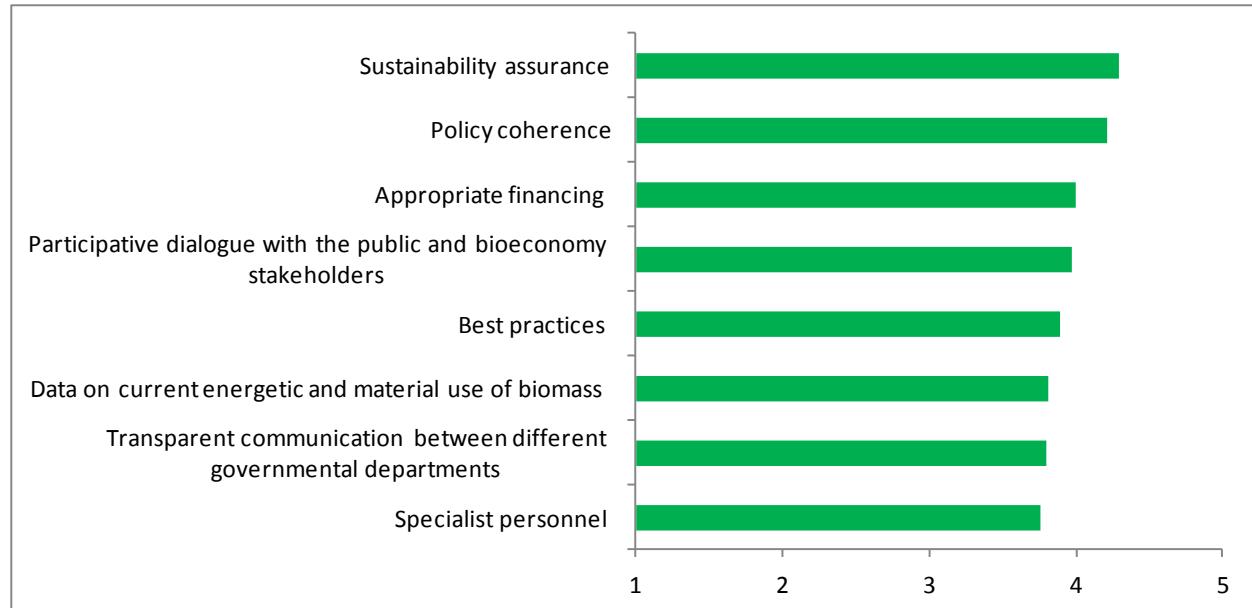
Under Question 6, respondents were asked to indicate their level of agreement on a scale from 1 (strongly disagree) to 5 (strongly agree) with several statements on challenges that need to be tackled for an inclusive and informed development of the bioeconomy.

Figure 6 shows that stakeholders perceive the main challenges of the bioeconomy to be:

- Lack of sustainability assurance
- Lack of policy coherence
- Lack of appropriate financing
- Lack of participative dialogue with the public and bioeconomy stakeholders

On the other hand, stakeholders expressed limited concerns in the areas specialist personnel, transparent intra-governmental communication, and data availability.

**Figure 6: Perceived challenges of the bioeconomy (1 (strongly disagree) to 5 (strongly agree))**



Question 6 also included the option of indicating additional challenges of the bioeconomy. Stakeholders stated the following main challenges:

- Lack of support for demonstration and commercialisation activities
- Limited access to biomass resources
- Lack of safety and risk management
- Lack of benefits to society (wealth distribution)
- Lack of level playing field between countries and applications
- Lack of long term policy and financing

It is therefore recommended to specifically address sustainability assurance and public acceptance of the bioeconomy in the upcoming BioSTEP policy workshops. Further important topics include policy coherence, the provision of appropriate financing instruments (namely for the implementation of demonstration and commercialisation activities) as well as the establishment of level playing fields between countries and different applications (biofuels, biomaterials, biochemicals).

## 4.2 SECTION II – Impacts

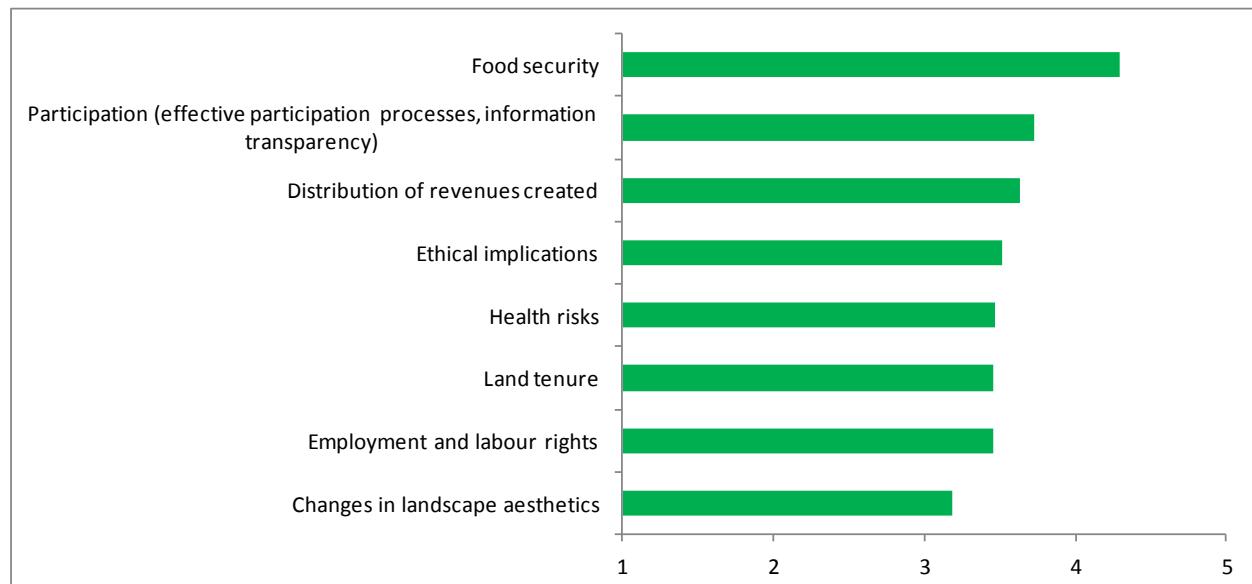
### 4.2.1 Social impacts of the bioeconomy

Under Question 7 respondents were asked to rate on a scale from 1 (not important) to 5 (very important) the importance of addressing the following issues with respect to potential social impacts of the bioeconomy.

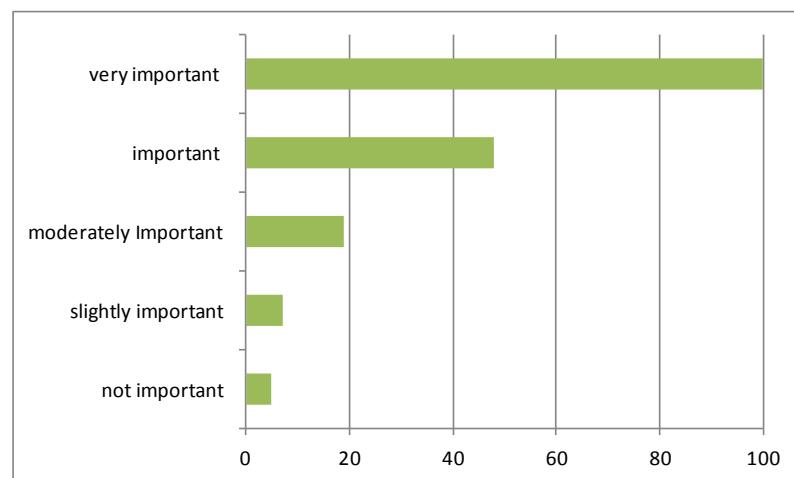
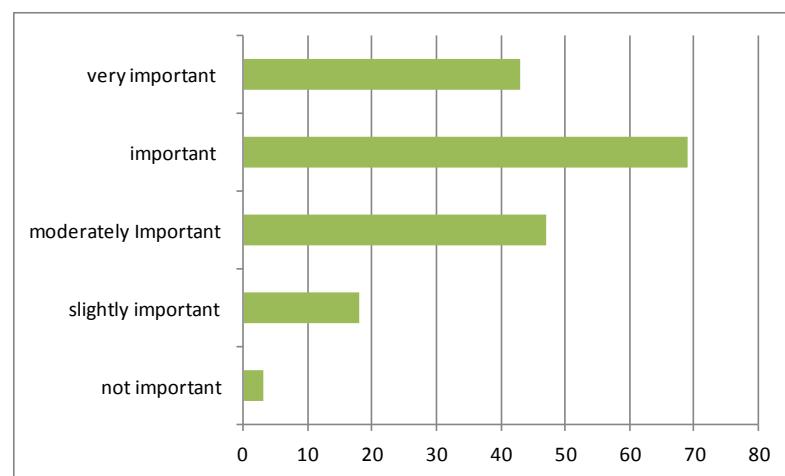
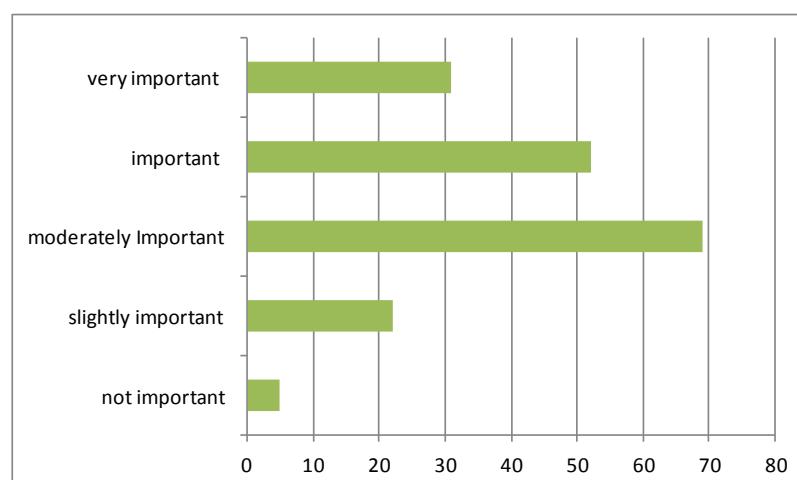
Figure 7 shows the strong importance attributed to potential negative impacts on food security. This is fully in line with concerns raised by stakeholders globally on the impacts of increased biomass, bioenergy and biomaterial production. Strong concerns also exist with respect to effective participation and the distribution of revenues created.

Social impacts on employment and labour rights, land tenure, health and overall ethical implications raise lower, but still considerable concerns. These topics are usually regarded as less critical in Europe whereas they often trigger major concerns in developing countries. Finally, changes in landscape aesthetics are attributed lowest importance.

**Figure 7: Social impacts of the bioeconomy (1 (not important) to 5 (very important))**



Figures 8-10 present in detail stakeholder responses on food security, participation and land tenure. More than 50% of stakeholders regard food security impacts as “very important”, whereas participation is regarded as “important” and land tenure as “moderately important” by the majority of stakeholders. Specifically, land tenure is not an important problem within Europe, but may be crucial to consider in developing countries.

**Figure 8: Insight view: Food security – Stakeholder responses****Figure 9: Insight view: Participation (effective participation processes, information transparency) – Stakeholder responses****Figure 10: Insight view: Land tenure – Stakeholder responses**

Question 7 also included the option of indicating additional potential social impacts of the bioeconomy. Stakeholders stated the following main additional social impacts:

- Consumer acceptance of new products and processes
- Globalisation, governance for global and local issues
- Creation of new business models with holistic vision of society

Finally, several stakeholders stated that all (social) impacts are highly dependent on the type of feedstock with residues and wastes usually having lower potential impact than energy crops grown on agricultural land.

Social impacts of the European bioeconomy shall therefore be addressed in discussion sessions of the BioSTEP policy workshops with focus on food security, effective participation and the distribution of revenues created.

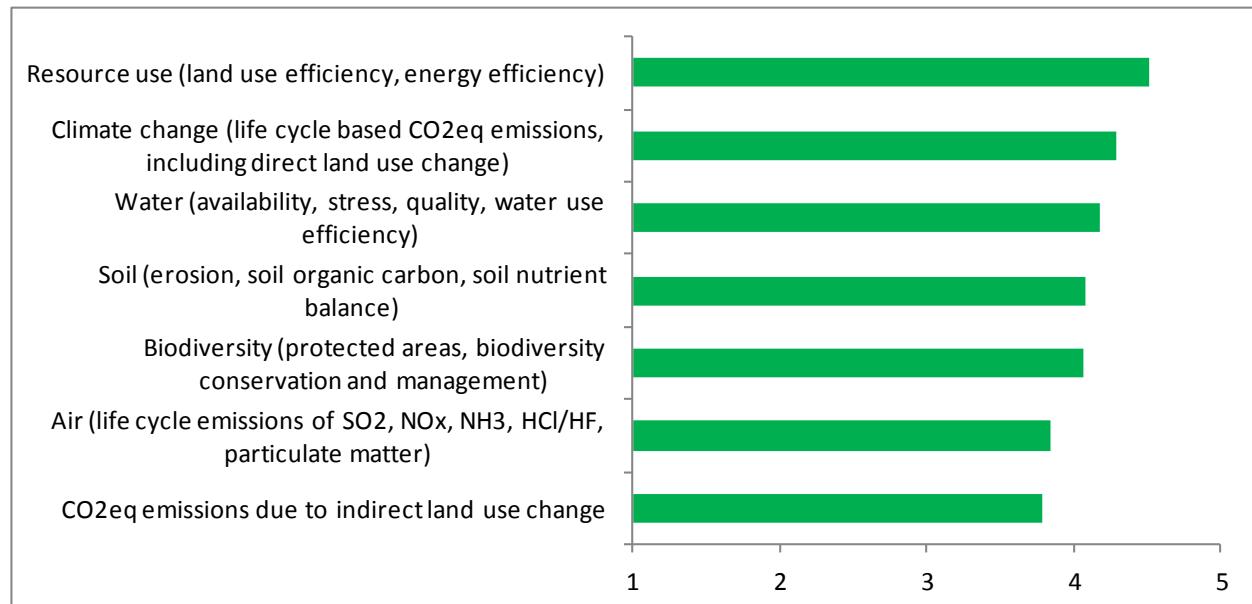
#### **4.2.2 Environmental impacts of the bioeconomy**

Under Question 8 respondents were asked to rate on a scale from 1 (not important) to 5 (very important) the importance of addressing the following issues with respect to potential environmental impacts of the bioeconomy.

Figure 11 shows that stakeholders indicated strong importance for all presented potential environmental impacts, with most impacts scoring >4 (i.e. “important”) on average. Highest concern was attributed to impacts on resource use (land use efficiency, energy efficiency). This importance of resource use was already stated under Question 5 where sustainable resource management was rated as most important benefit of the bioeconomy.

Environmental impacts on climate change, water, soil and biodiversity were regarded as “important” on average, whereas stakeholders attributed slightly lower importance to CO<sub>2</sub>eq emissions due to indirect land use change and air pollution.

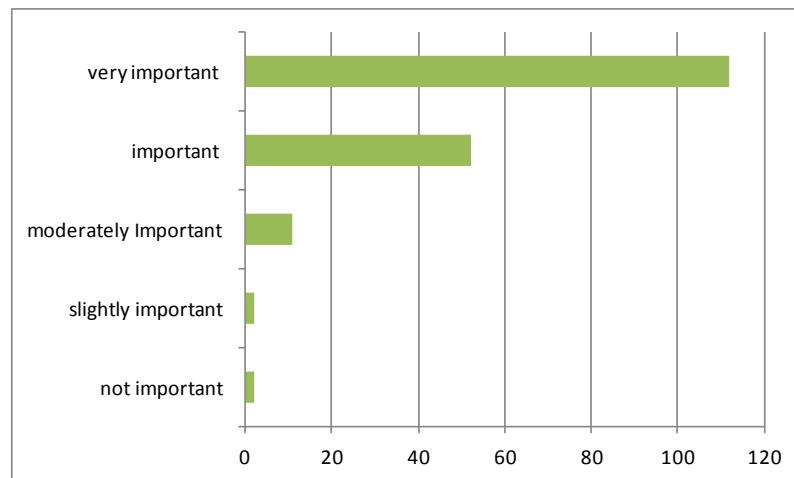
**Figure 11: Environmental impacts of the bioeconomy (1 (not important) to 5 (very important))**



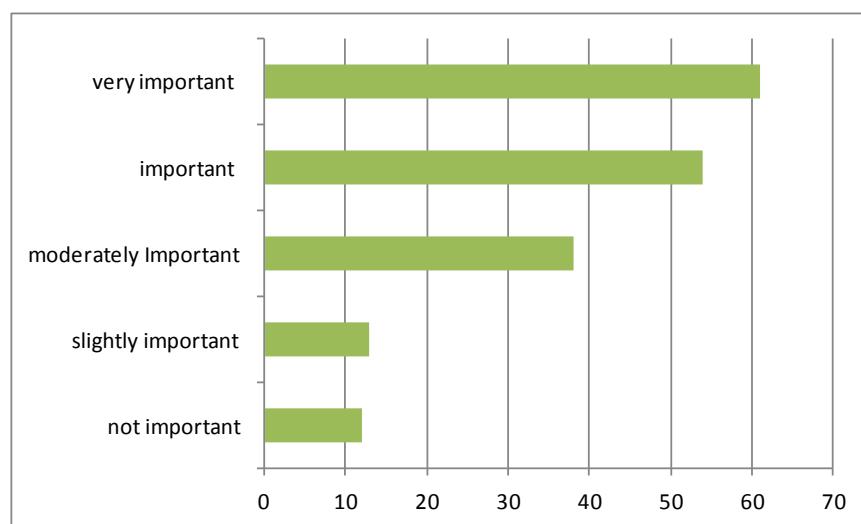
Figures 12 and 13 show a detailed presentation of stakeholder responses on resource use and CO<sub>2</sub>eq emissions due to indirect land use change. More than 60% of stakeholders regard resource use impacts as “very important”, with almost all remaining stakeholders opting for “important”.

For CO<sub>2</sub>eq emissions due to indirect land use change, the majority of stakeholders selected “very important” or “important”, whereas several stakeholders opt for “not important” or “slightly important”. The latter may result from on-going controversies regarding the reliability of methodologies to assess indirect land use change impacts.

**Figure 12: Insight view: Resource use (land use efficiency, energy efficiency) – Stakeholder responses**



**Figure 13: Insight view: Insight view: CO<sub>2</sub>eq emissions due to indirect land use change – Stakeholder responses**



Question 8 also included the option of indicating additional potential environmental impacts of the bioeconomy. Stakeholders stated the following main additional environmental impacts:

- Urban and industrial waste management
- Avoided emissions
- Protection of marine environments
- Promotion of sustainable forest management

These open contributions to Question 8 by stakeholders underline the fact that environmental impacts do not necessarily have to be negative, but can also be positive. Both kinds of impacts need to be addressed in future activities of the BioSTEP project.

Environmental impacts of the European bioeconomy shall therefore be addressed in discussion sessions at the BioSTEP policy workshops with focus on resource use (land use efficiency, energy efficiency), climate change, water, soil and biodiversity.

## 4.3 SECTION III – Strategies to address challenges

### 4.3.1 Ensuring sustainability

Under Question 9 respondents were asked to rate on a scale from 1 (not important) to 5 (very important) the importance of several measures to ensure sustainability within the emerging bioeconomy.

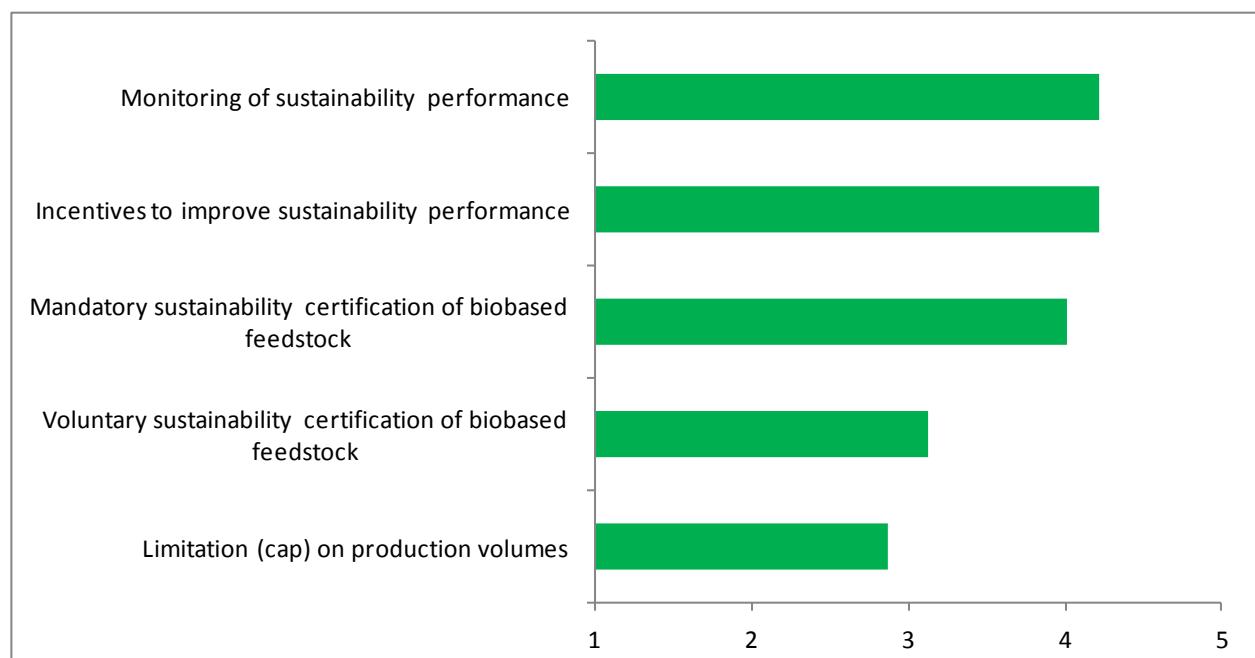
In Section 1 on “benefits and challenges” sustainability assurance was identified as the most important challenge facing the European bioeconomy.

Stakeholders attributed highest importance to monitoring of sustainability performance and incentives to improve sustainability performance in order to ensure sustainability within the emerging bioeconomy (see Figure 14). Both measures focus on assistance offered to bioeconomy market players to improve performance rather than on strict regulatory measures. Such measures would facilitate initial market development with the aim to benefit from “learning by doing” towards continuously improved sustainability performance.

Mandatory sustainability certification was attributed significantly higher importance than voluntary sustainability certification. As voluntary agreements often do not live up to their promises, mandatory measures are regarded necessary to ensure “minimum” sustainability performance.

The low importance attributed to limitations on production volumes is interesting in the light of the recent cap introduced for food-based biofuels implemented in the framework of the revision of the EU Renewable Energy Directive (RED) – “ILUC Directive”.

**Figure 14: Measures to ensure sustainability within the emerging bioeconomy (1 (not important) to 5 (very important))**



Stakeholders proposed additional measures to ensure sustainability within the emerging bioeconomy:

- Implementing CO<sub>2</sub> taxes and CO<sub>2</sub> pricing
- Promoting cascading use of biomass (giving priority to chemicals and products)
- Promoting the efficient use of biomass (i.e. by limiting subsidies for bioenergy and focussing on use of biomass for material purposes)

- Addressing likely trade-offs and synergies between competing uses of biomass
- Internationally agreed metrics on biomass sustainability
- Area risk based certification schemes (e.g. Sustainable Biomass Partnership (SBP))
- Clear global definition of sustainability
- Appropriate measures under CAP to improve sustainable management of agricultural land and forest, coupled with adequate support to farmers and foresters to adapt practices

The following ***measures to ensure sustainability*** should be discussed in more detail in the framework of the BioSTEP policy workshops: monitoring of sustainability performance, incentives to improve sustainability performance, comparing mandatory and voluntary sustainability certification, international harmonisation of sustainability schemes, promoting cascading use of biomass, as well as trade-offs and synergies between competing uses of biomass.

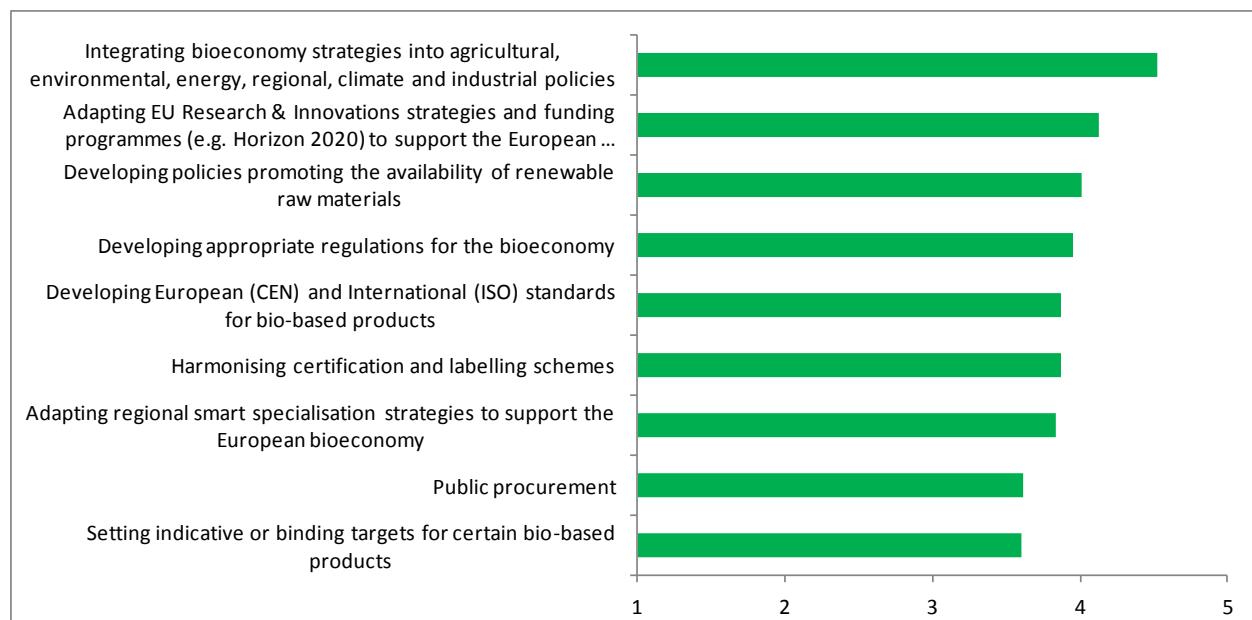
#### 4.3.2 Ensuring policy coherence

Under Question 10 respondents were asked to rate on a scale from 1 (not important) to 5 (very important) the importance of several measures to ensure policy coherence within the emerging bioeconomy.

Highest importance was attributed to integrating bioeconomy strategies into agricultural, environmental, energy, regional, climate and industrial policies (see Figure 15). A holistic policy approach integrating several sectors is therefore needed to ensure success of the European bioeconomy. This holistic policy shall be supported by comprehensive EU Research & Innovations strategies and funding programmes (e.g. Horizon 2020), specific policies promoting the availability of raw material and the development of appropriate regulations for the bioeconomy.

Stakeholders attributed slightly lower importance to the development of standards, the adaptation of regional smart specialisation strategies and the harmonisation of certification and labelling schemes. Finally, stakeholders see public procurement as well as indicative or binding targets as less appropriate to ensure policy coherence within the European bioeconomy.

**Figure 15: Measures to ensure policy coherence within the emerging bioeconomy (1 (not important) to 5 (very important))**



Stakeholders proposed additional measures to ensure policy coherence within the emerging bioeconomy:

- Adapting national-level innovation policies to support an innovative, sustainable bioeconomy

- Strengthening policies that disincentives the use of fossil fuel resources (e.g. EU Emissions Trading System (ETS), energy and carbon taxes, waste and recycling regulation)
- Establishing coherent policy frameworks for the protection of forest ecosystems
- Ensuring policy coherence also outside the EU
- Extending and improving ETS for CO<sub>2</sub> certificates in EU, stronger taxation of fossil fuels, based on their CO<sub>2</sub> emission potential
- Integrating into “Green Economy”, “Circular Economy” and UN SDGs
- Establishing level playing fields for oil-based products, biomass for energy, biomass for products
- Introducing the concept of “Sustainable Regions” following the principles:
  - a joint focus on greenhouse gas reduction, adequate land use, prevention of soil degradation and recovery programs when needed, restoration of degraded lands or forests
  - optimize agricultural, forestry and marine output, thus contributing to an increasing and competitive supply
  - a regional differentiated strategy according to natural (climate zone, soils, biodiversity), social or economic conditions to prevent environmental harm and to facilitate social and economic growth
- Harmonising financial instruments

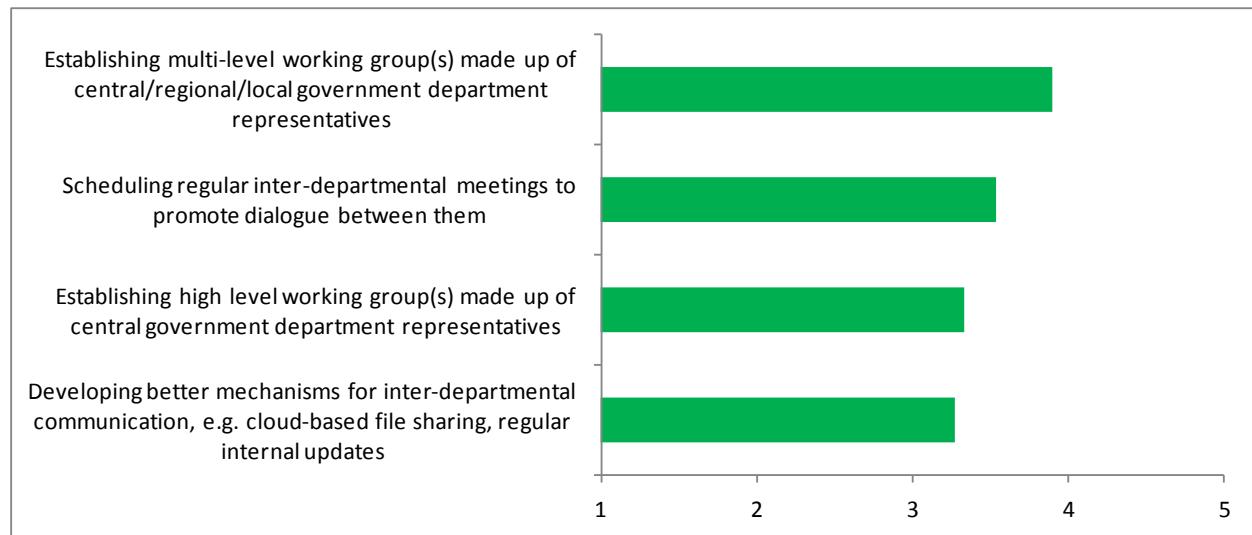
The following **measures to ensure policy coherence** should be discussed in more detail in the framework of the BioSTEP policy workshops: sector integration of bioeconomy strategies, EU Research & Innovations strategies and funding programmes, policies promoting the availability of raw material, policy disincentives for the use of fossil fuels and the concept of “Sustainable Regions”.

#### 4.3.3 Improving intra-governmental communication

Under Question 11 respondents were asked to rate on a scale from 1 (not important) to 5 (very important) the importance of several measures to improve intra-governmental communication within the emerging bioeconomy.

Figure 16 shows that highest importance was attributed to establishing multi-level working group(s) made up of central/regional/local government department representatives. Regular inter-departmental meetings, high level working group(s) made up of central government department representatives and the development of better mechanisms for inter-departmental communication were regarded as less important.

**Figure 16: Measures to improve intra-governmental communication (1 (not important) to 5 (very important))**



The following additional measures to improve intra-governmental communication within the emerging bioeconomy were proposed by stakeholders:

- Establishing high-level working group with CEOs of sustainability driven companies, NGOs and governments
- Organising global summits
- Organising externally moderated workshops

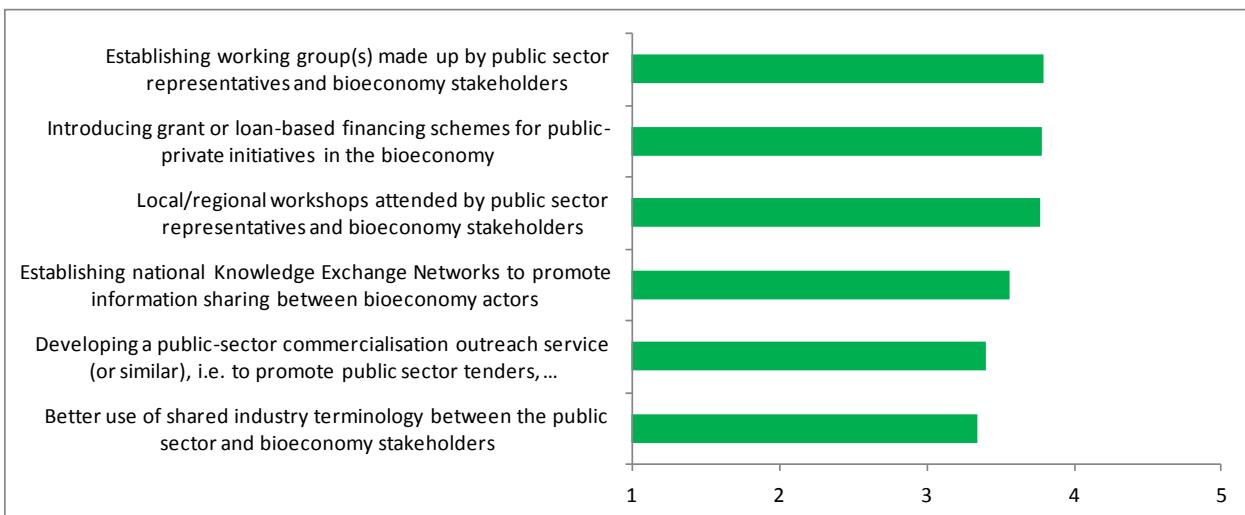
Stakeholders highlighted the importance of agreeing on common targets and the clear identification of a leading department (focal point). Furthermore, as some biomass used in the EU is sourced from non-EU countries such as the United States, inter-governmental communication with these countries is important as well. Finally, stakeholders proposed to focus on action rather than working groups.

#### 4.3.4 Promoting a participative dialogue

Under Question 12 respondents were asked to rate on a scale from 1 (not important) to 5 (very important) the importance of several measures to promote a participative dialogue with the public and bioeconomy stakeholders.

Stakeholders attributed high importance to dedicated working group(s) made up by public sector representatives and bioeconomy stakeholders, grant or loan-based financing schemes for public-private initiatives as well as local and regional workshops (see Figure 17). Specific stakeholder contributions (see below) further highlighted the importance of public-private collaboration to promote and support the market introduction of innovative bioenergy solutions and business models.

National knowledge exchange networks, public-sector commercialisation outreach services and a shared industry terminology were viewed as less relevant.

**Figure 17: Measures to promote participative dialogue (1 (not important) to 5 (very important))**

The following additional measures to promote a participative dialogue with the public and bioeconomy stakeholders were proposed by stakeholders:

- Promoting and supporting entrepreneurial education, start-ups, spin-offs
- Ensuring access to finance for innovative business models
- Establishing better leadership and a dedicated bioeconomy development organisation
- Establishing a "Promotion Agency" to distribute Show Cases
- Establishing local and regional clusters (instead of working groups) aiming to implement projects (including industry and scientists)
- Addressing power asymmetries to avoid dialogues being corporate sales activities
- Stimulating and supporting public (citizens) market demand
- Integrating local and regional NGOs in the development of the bioeconomy
- Involving scientific stakeholders in the dialogue

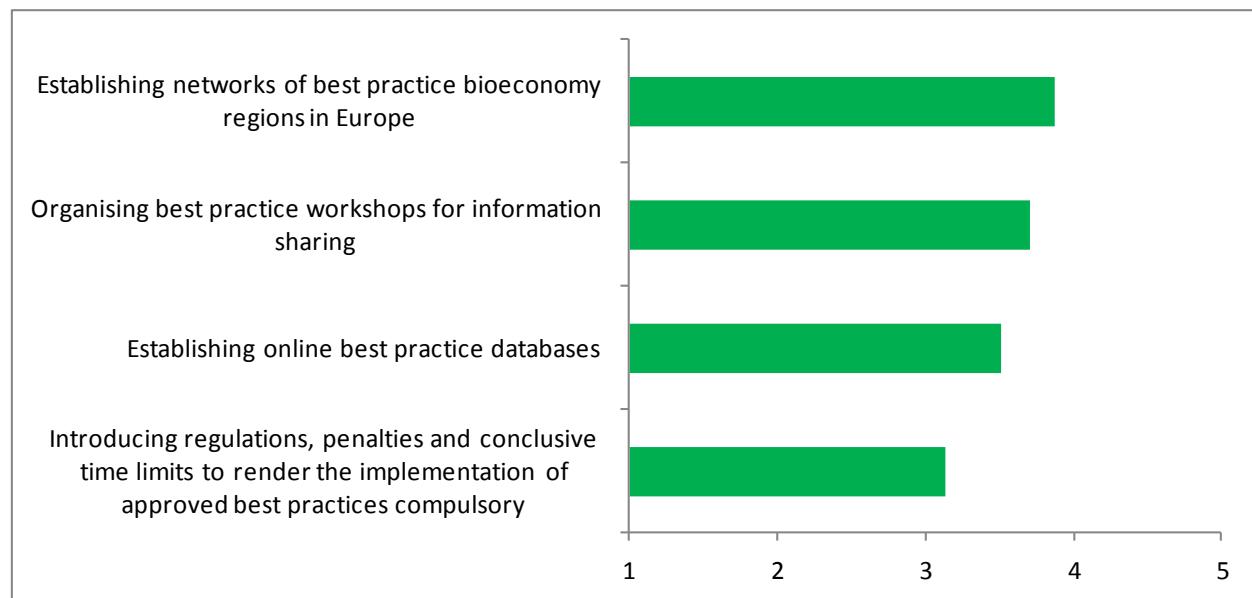
#### 4.3.5 Sharing best practices

Under Question 13 respondents were asked to rate on a scale from 1 (not important) to 5 (very important) the importance of several measures to share best practices within the emerging bioeconomy.

According to Section 1 on "Benefits and challenges" stakeholders only attribute medium importance to the sharing of best practices within the European bioeconomy (see Figure 6). This is reflected by the average score of <4 (i.e. "important") for all measures to be evaluated under this question (see Figure 18).

Highest importance was attributed to establishing networks of best practice bioeconomy regions in Europe and organising best practice workshops for information sharing. This result is in line with additional measures to promote a participative dialogue proposed by stakeholders under Question 12.

Stakeholders indicated lower relevance for the establishment of online best practice databases and for compulsory implementation of approved best practices.

**Figure 18: Measures to share best practice (1 (not important) to 5 (very important))**

The following additional measures to share best practices within the emerging bioeconomy were proposed by stakeholders:

- Sharing best practices with interested parties/countries outside the EU
- Sharing best practices via social media, TV etc.
- Ensuring that best-practices become all-parties concerned, well-debated standard practices (via standardization and certification)

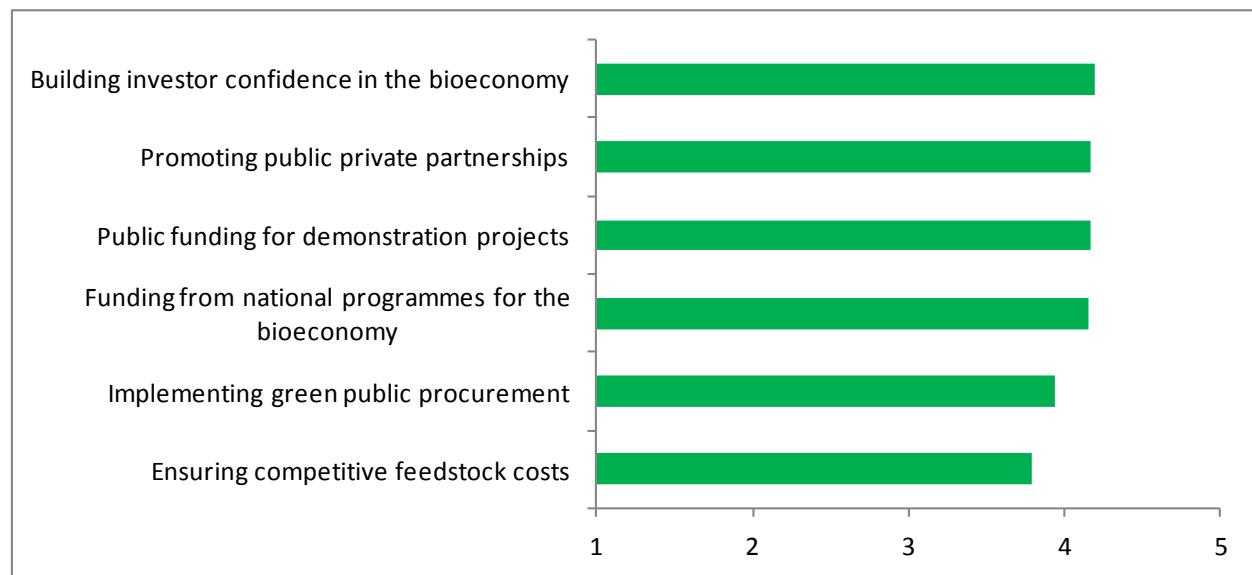
#### **4.3.6 Ensuring appropriate financing**

Under Question 14 respondents were asked to rate on a scale from 1 (not important) to 5 (very important) the importance of several measures to ensure appropriate financing within the emerging bioeconomy.

In Section 1 stakeholders highlighted the “lack of appropriate financing” as one of the most important challenges within the emerging European bioeconomy (see Figure 6).

Figure 19 shows that highest (and almost equal) importance was attributed to building investor confidence in the bioeconomy, promoting public private partnerships, public funding for demonstration projects as well as funding from national programmes for the bioeconomy. The establishment of a stable, long-term and supportive policy and regulatory framework encompassing policy coherence between different sectors involved and effective sustainability insurance is generally seen as crucial pre-requisite for investor confidence in the bioeconomy. Furthermore, stakeholders already underlined the importance of promoting public-private partnerships and supporting bioeconomy demonstration projects under Question 12 addressing the participative dialogue with the public and bioeconomy stakeholders.

Stakeholders indicated lower relevance for green public procurement and ensuring competitive feedstock costs.

**Figure 19: Measures to ensure appropriate financing (1 (not important) to 5 (very important))**

The following additional measures to ensure appropriate financing were proposed by stakeholders:

- Implementing loan guarantee mechanisms for start-ups
- Simplified credit guarantees for innovation companies that are investing
- Financial support for small-scale producers of biomass and bioeconomy-related SMEs
- Incentives/subsidies for businesses that invest private capital and reinvest profits in new industrial products (not energy) creating new jobs and new local value chains
- Creating markets by mandatory introduction of biochemicals and biomaterials
- Favourable tax treatment for investment in new technologies
- Exploiting synergies among existing funds (CAP, EFSI, Structural Funds)
- Communicating environmental and quality advantages of biobased products to consumers, to enhance willingness to pay

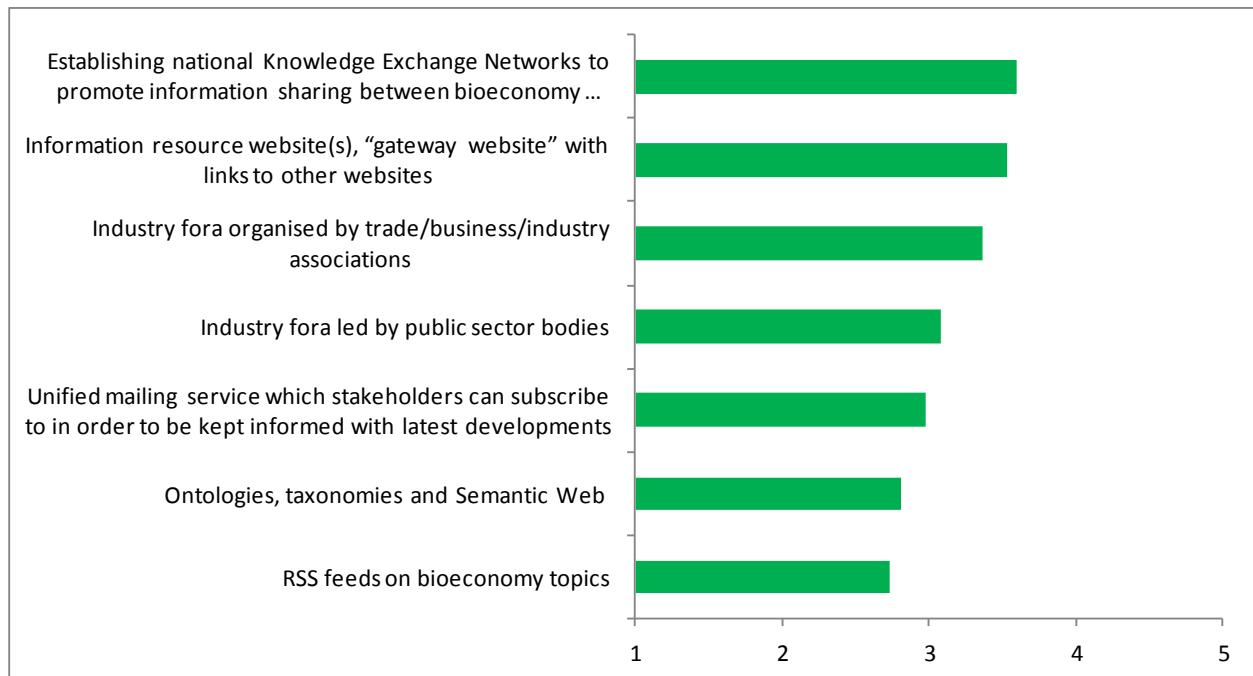
The following **measures to ensure appropriate financing** should be discussed in more detail in the framework of the BioSTEP policy workshops: public-private partnerships, public funding for demonstration projects, guarantee mechanisms for start-ups, innovation companies and SMEs, synergies among existing funds (CAP, EFSI, Structural Funds).

#### **4.3.7 Ensuring appropriate data availability**

Under Question 15 respondents were asked to rate on a scale from 1 (not important) to 5 (very important) the importance of several measures to ensure appropriate data availability within the emerging bioeconomy.

Highest importance was attributed to establishing national Knowledge Exchange Networks to promote information sharing between bioeconomy actors and information resource websites (see Figure 20). On the other hand, stakeholders indicated lower relevance to industry fora, unified mailing services, ontologies, taxonomies and Semantic Web as well as RSS feeds on bioeconomy topics.

**Figure 20: Measures to ensure appropriate data availability (1 (not important) to 5 (very important))**



The following additional measures to ensure appropriate data availability were proposed by stakeholders:

- Encouraging governments and public institutions to establish systems and obligations to assess data as in other industrial sectors
- Including actual key performance indicators (KPIs) and trends by country, region, sector, industry, and their return on investment (ROI) including bonuses and penalties in info websites.
- Making available clear data on availability of biomass and on climate benefits of different uses of biomass for substituting certain materials compared to energetic uses
- Strengthening the European Bioeconomy Observatory

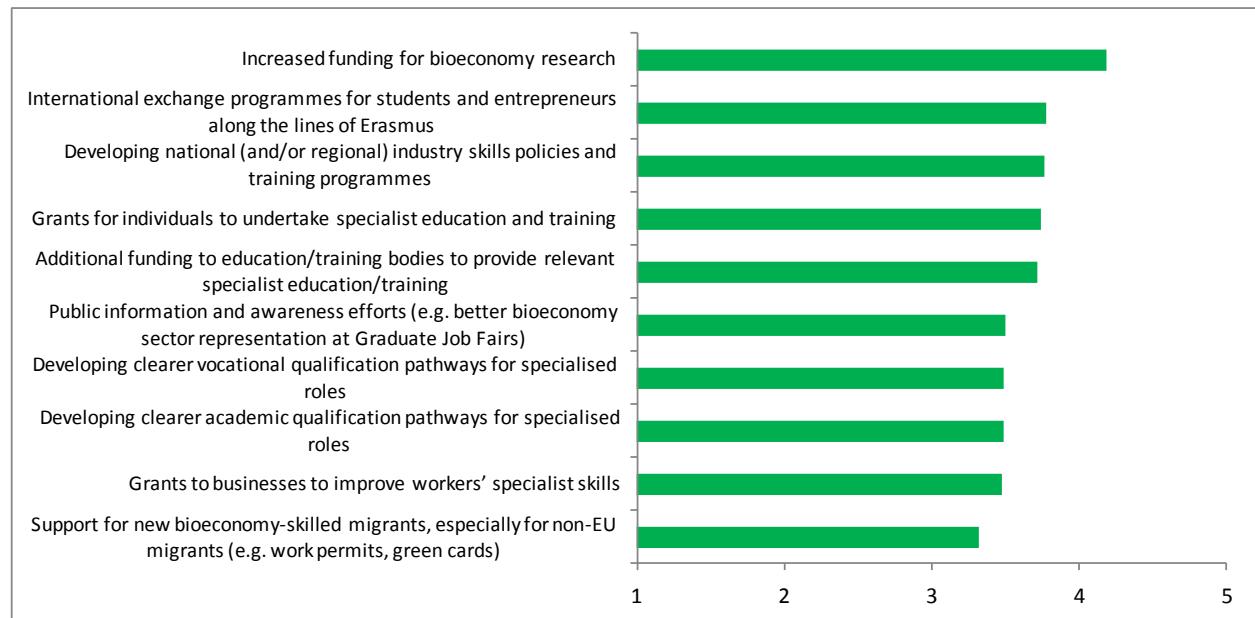
#### 4.3.8 Ensuring sufficient specialist personnel

Under Question 15 respondents were asked to rate on a scale from 1 (not important) to 5 (very important) the importance of several measures to ensure sufficient specialist personnel for the development of a strong and sustainable European bioeconomy.

Stakeholders attributed highest importance to increased funding for bioeconomy research. The importance of comprehensive EU Research & Innovations strategies and funding programmes (e.g. Horizon 2020) was already highlighted under Question 10 addressing policy coherence.

The education of specialist personnel may also be supported by international exchange programmes for students and entrepreneurs, national (and/or regional) industry skills policies and training programmes, individual grants for specialist education as well as additional funding to educational/training bodies. Stakeholders indicated slightly lower relevance for public information and awareness efforts, clearer vocational and academic qualification pathways and grants to businesses to improve workers' specialist skills. Finally, support for new bioeconomy-skilled migrants (e.g. work permits, green cards) was regarded as less important.

**Figure 21: Measures to ensure sufficient specialist personnel (1 (not important) to 5 (very important))**



The following additional measures to ensure sufficient specialist personnel were proposed by stakeholders:

- Creating a more entrepreneurial mind set in Europe (through education)
- Creating commercialisation expertise and skills
- Providing training for upscaling in multi-disciplinary teams (i.e. bioinformaticians, lab-staff (biotech) and engineers) to bridge the gap from research to demonstration and pilot-scale production
- Supporting joint European research programmes and research programmes between EU countries and developing countries

## 5 Key findings

### ***Key findings: Perceived benefits of the bioeconomy***

Strongest stakeholder agreement on perceived benefits was indicated for managing natural resources sustainably, thus placing the importance of the bioeconomy in a wider societal context. This importance of the wider societal context is also underlined by the strong agreement with the benefits supporting investment in new infrastructures and supporting investment in knowledge, innovation and skills.

The contribution of the bioeconomy to reducing dependence on non-renewable resources and to mitigating and adapting to climate change was seen as more critical. This may be due to the on-going discussion on GHG impacts of biomass production and use and the inherent limitations of biomass availability.

### ***Key findings: Challenges of the bioeconomy***

Strongest stakeholder agreement on challenges of the bioeconomy was indicated with respect to sustainability assurance, policy coherence, appropriate financing, and participative dialogue with the public and bioeconomy stakeholders. The latter challenge is directly addressed by BioSTEP with its overall aim to promote a public dialogue on the goals of the bioeconomy and the steps needed to move towards a sustainable economy and way of life.

On the other hand, stakeholders expressed limited concerns in the areas concerning specialist personnel, transparent intra-governmental communication and data availability.

### ***Key findings: Social impacts***

Stakeholders attributed utmost importance to potential negative impacts of the bioeconomy on food security. This is fully in line with concerns raised globally on the impacts of increased biomass, bioenergy and bio-product production. Strong concerns also exist with respect to effective participation and the distribution of revenues created.

Social impacts on employment and labour rights, land tenure, health and overall ethical implications raise lower, but still considerable concerns. These topics are usually regarded as less critical in Europe whereas they often trigger major concerns in developing countries. Changes in landscape aesthetics are attributed lowest importance.

Finally, several stakeholders stated that all (social) impacts are highly dependent on the type of feedstock with residues and wastes usually having lower potential impact than energy crops grown on agricultural land.

### ***Key findings: Environmental impacts***

Stakeholders regarded all presented potential environmental impacts as “important” on average. Highest concern was attributed to impacts on resource use (land use efficiency, energy efficiency). This importance of resource use is in line with key findings under perceived benefits of the bioeconomy with respect to managing natural resources sustainably.

Environmental impacts on climate change, water, soil and biodiversity were regarded as “important” on average whereas stakeholders attributed slightly lower importance to air pollution and CO<sub>2</sub>eq emissions due to indirect land use change. The latter may result from on-going controversies regarding the reliability of methodologies to assess indirect land use change impacts.

### ***Key findings: Ensuring sustainability***

Stakeholders attributed highest importance to monitoring of sustainability performance and incentives to improve sustainability performance in order to ensure sustainability within the emerging bioeconomy. Both measures focus on assistance offered to bioeconomy market players to improve performance rather than on strict regulatory measures. Such measures would facilitate initial market development with the aim to benefit from “learning by doing” towards continuously improved sustainability performance.

Mandatory sustainability certification was attributed higher importance than voluntary sustainability certification. As voluntary agreements often do not live up to their promises, mandatory measures are regarded necessary to ensure “minimum” sustainability performance. The low importance attributed to limitations on production volumes is interesting in the light of the recent cap introduced for food based biofuels implemented in the framework of the revision of the EU Renewable Energy Directive (RED) – “ILUC Directive”.

#### ***Key findings: Ensuring policy coherence***

Highest importance was attributed to integrating bioeconomy strategies into agricultural, environmental, energy, regional, climate and industrial policies. A holistic policy approach integrating several sectors is therefore needed to ensure success of the European bioeconomy. This holistic policy shall be supported by comprehensive EU Research & Innovations strategies and funding programmes (e.g. Horizon 2020), specific policies promoting the availability of raw material and the development of appropriate regulations for the bioeconomy.

Stakeholders attributed slightly lower importance to the development of standards, the adaptation of regional smart specialisation strategies and the harmonisation of certification and labelling schemes. Finally, stakeholders see public procurement as well as indicative or binding targets as less appropriate to ensure policy coherence within the European bioeconomy.

#### ***Key findings: Improving intra-governmental communication***

Highest importance was attributed to establishing multi-level working group(s) made up of central/regional/local government department representatives whereas regular inter-departmental meetings, high level working group(s) made up of central government department representatives and the development of better mechanisms for inter-departmental communication were regarded less important.

Stakeholders highlighted the importance of agreeing on common targets and the clear identification of a leading department (focal point). Furthermore, as some biomass used in the EU is sourced from non-EU countries, inter-governmental communication with these countries is important as well.

#### ***Key findings: Promoting a participative dialogue***

Responses to this question are of specific relevance due to the main aim of the BioSTEP project to promote a participative governance of the European bioeconomy through the engagement of stakeholders and citizens

Stakeholders attributed high importance to dedicated working group(s) made up by public sector representatives and bioeconomy stakeholders, grant or loan-based financing schemes for public-private initiatives as well as local and regional workshops. Specific stakeholder contributions further highlighted the importance of public-private collaboration to promote and support the market introduction of innovative bioenergy solutions and business models.

#### ***Key findings: Sharing best practices***

Highest importance was attributed to establishing networks of best practice bioeconomy regions in Europe and organising best practice workshops for information sharing. Within BioSTEP the establishment of networks of best practice bioeconomy regions is supported by activities on “Identifying national and regional good practices” including the organisation of best practice workshops. Stakeholders indicated lower relevance for the establishment of online best practice databases and for compulsory implementation of approved best practices.

#### ***Key findings: Ensuring appropriate financing***

Stakeholders attributed highest (and almost equal) importance to building investor confidence in the bioeconomy, promoting public-private partnerships, public funding for demonstration projects as well as funding from national programmes for the bioeconomy. The establishment of a stable, long-term and supportive policy and regulatory framework encompassing policy coherence between different sectors involved and effective sustainability assurance is generally seen as crucial pre-requisite for investor confidence in the bioeconomy. Furthermore, stakeholders already underlined the importance

of promoting public-private partnerships and of supporting bioeconomy demonstration projects under measures addressing the participative dialogue with the public and bioeconomy stakeholders. Stakeholders indicated lower relevance for green public procurement and ensuring competitive feedstock costs.

***Key findings: Ensuring appropriate data availability***

Highest importance was attributed to establishing national Knowledge Exchange Networks to promote information sharing between bioeconomy actors and information resource websites. On the other hand, stakeholders indicated lower relevance to industry fora, unified mailing services, ontologies, taxonomies and Semantic Web as well as RSS feeds on bioeconomy topics.

***Key findings: Ensuring sufficient specialist personnel***

Stakeholders attributed highest importance to increased funding for bioeconomy research. The importance of comprehensive EU Research & Innovations strategies and funding programmes (e.g. Horizon 2020) was already highlighted under the topic policy coherence.

The education of specialist personnel can also be supported by international exchange programmes for students and entrepreneurs, national (and/or regional) industry skills policies and training programmes, individual grants for specialist education as well as additional funding to educational/training bodies. Stakeholders indicated slightly lower relevance for public information and awareness efforts, clearer vocational and academic qualification pathways, and grants to businesses to improve workers' specialist skills.

## **6 Annex: Questionnaire**

# Policy recommendations for the future development of the European bioeconomy

Fields marked with \* are mandatory.



## Questionnaire

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BioSTEP is an EU-funded project that aims to promote a participative governance of the European bioeconomy through the engagement of stakeholders and citizens (<http://www.bio-step.eu>). The project utilizes a participatory approach to involve a variety of actors in a dialogue on the future development of the bioeconomy.

This questionnaire comprises one part of BioSTEP's consultative process and will help us to understand how different actors perceive the challenges, opportunities and policy gaps surrounding the development and strengthening of national and regional bioeconomy strategies.

We welcome your participation as it is a key component of gathering insights on existing (policy) challenges and potential (policy) measures to address them. The results will inform the design of three policy workshops, which BioSTEP will organise in 2016. The outcome of this process will be a list of targeted policy recommendations for the (further) development of balanced and informed bioeconomy strategies at the regional, national and European levels.

The questionnaire should take approximately 15 minutes to complete. We would be grateful for your completed response before December 6, 2015, until which time you may save your entries and resume the consultation via the "Save as Draft" button.

If you would like to receive further information on the BioSTEP project and the upcoming policy workshops, please provide your contact details in section 18 of the questionnaire. For any questions about the content or functioning of the questionnaire, please contact the BioSTEP team at [consultation@bio-step.eu](mailto:consultation@bio-step.eu).

## **Privacy Statement**

If you wish for BioSTEP to follow-up your contribution after the survey, you are agreeing that your personal data (contact details, etc) will be stored. All answers to the questions are voluntary. Your replies will be kept for a period of 5 years after receipt of the questionnaire. Should you require further information or wish to exercise your rights under the German Federal Data Protection Act (Bundesdatenschutzgesetz) (e.g. to access, rectify, or delete your data), please contact the BioSTEP team at [consultation@bio-step.eu](mailto:consultation@bio-step.eu). You can also contact the project coordinator's Data Protection Officer ([datenschutz@ecologic.eu](mailto:datenschutz@ecologic.eu)). The data provided will only be used within the BioSTEP project. Your questionnaire might be shared with the project partners for their information. If you do not wish for this to happen, please inform us accordingly. Personal data and the questionnaire responses will not be disclosed, shared with or sold to any third party.

## I. General information

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1. Country in which you work most of the time:

2. Type of organisation that you work for (multiple choices are allowed):

- Government (European, national, regional, local)
- Industry and SME
- Consultancy
- Universities and research centres
- NGOs/CSOs
- Financing institution
- Other

If "Other", please specify

3. Sector:

- Biofuels
- Biomaterials
- Biorefinery
- Other

If "Other", please specify

4. Field of activity (multiple choices are allowed, please select all that are appropriate):

- Agriculture
- Fisheries and aquaculture
- Forestry
- Food and feed
- Energy and biofuels
- Industrial biotechnology
- Chemicals
- Environment
- Transport
- Health
- Socioeconomics
- Nanotechnology
- Other

If "Other", please specify

## II. Benefits and challenges of the bioeconomy

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### 5. Benefits

Please indicate your level of agreement with the following perceived benefits offered by the bioeconomy on a scale from 1 (strongly disagree) to 5 (strongly agree).

	1	2	3	4	5
Reducing dependence on non-renewable resources	<input type="radio"/>				
Mitigating and adapting to climate change	<input type="radio"/>				
Creating jobs and maintaining European competitiveness	<input type="radio"/>				
Supporting investment in knowledge, innovation and skills	<input type="radio"/>				
Supporting investment in new infrastructures	<input type="radio"/>				
Managing natural resources sustainably	<input type="radio"/>				
Other	<input type="radio"/>				

If "Other", please specify

## 6. Challenges

Please rate on a scale from 1 (not important) to 5 (very important) the importance of addressing the following challenges that need to be tackled for an inclusive and informed development of the bioeconomy.

	1	2	3	4	5
Sustainability assurance (see question 9)	<input checked="" type="radio"/>				
Policy coherence (see question 10)	<input checked="" type="radio"/>				
Transparent communication between different governmental departments (see question 11)	<input checked="" type="radio"/>				
Participative dialogue with the public and bioeconomy stakeholders (see question 12)	<input checked="" type="radio"/>				
Best practices (see question 13)	<input checked="" type="radio"/>				
Appropriate financing (see question 14)	<input checked="" type="radio"/>				
Data on current energetic and material use of biomass (see question 15)	<input checked="" type="radio"/>				
Specialist personnel (see question 16)	<input checked="" type="radio"/>				
Other	<input checked="" type="radio"/>				

If "Other", please specify

## III. Potential impacts of the bioeconomy

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## 7. Social Impacts

Please rate on a scale from 1 (not important) to 5 (very important) the importance of addressing the following issues for the assessment of potential social impacts of the bioeconomy.

	1	2	3	4	5
Food security	<input type="radio"/>				
Participation (effective participation processes, information transparency)	<input type="radio"/>				
Land tenure	<input type="radio"/>				
Employment and labour rights	<input type="radio"/>				
Distribution of revenues created	<input type="radio"/>				
Health risks	<input type="radio"/>				
Changes in landscape aesthetics	<input type="radio"/>				
Ethical implications	<input type="radio"/>				
Other	<input type="radio"/>				

If "Other", please specify

## 8. Environmental Impacts

Please rate on a scale from 1 (not important) to 5 (very important) the importance of addressing the following issues for the assessment of potential environmental impacts of the bioeconomy.

	1	2	3	4	5
Resource use (land use efficiency, energy efficiency)	<input type="radio"/>				
Climate change (life cycle based CO <sub>2</sub> eq emissions, including direct land use change)	<input type="radio"/>				
CO <sub>2</sub> eq emissions due to indirect land use change	<input type="radio"/>				
Biodiversity (protected areas, biodiversity conservation and management)	<input type="radio"/>				
Soil (erosion, soil organic carbon, soil nutrient balance)	<input type="radio"/>				
Water (availability, stress, quality, water use efficiency)	<input type="radio"/>				
Air (life cycle emissions of SO <sub>2</sub> , NO <sub>x</sub> , NH <sub>3</sub> , HCl/HF, particulate matter)	<input type="radio"/>				
Other	<input type="radio"/>				

If "Other", please specify

## IV. Strategies to address challenges

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### 9. Ensuring sustainability

How would you assess the importance of the following measures to ensure sustainability within the emerging bioeconomy? Please rate on a scale from 1 (not important) to 5 (very important).

	1	2	3	4	5
Voluntary sustainability certification of biobased feedstock	<input type="radio"/>				
Mandatory sustainability certification of biobased feedstock	<input type="radio"/>				
Limitation (cap) on production volumes	<input type="radio"/>				
Monitoring of sustainability performance	<input type="radio"/>				
Incentives to improve sustainability performance	<input type="radio"/>				
Other	<input type="radio"/>				

If "Other", please specify

## 10. Ensuring policy coherence

How would you assess the importance of the following measures to ensure policy coherence within a strong and sustainable European bioeconomy? Please rate on a scale from 1 (not important) to 5 (very important).

	1	2	3	4	5
Integrating bioeconomy strategies into agricultural, environmental, energy, regional, climate and industrial policies	<input type="radio"/>				
Adapting regional smart specialisation strategies to support the European bioeconomy	<input type="radio"/>				
Adapting EU Research & Innovations strategies and funding programmes (e.g. Horizon 2020) to support the European bioeconomy	<input type="radio"/>				
Developing policies promoting the availability of renewable raw materials	<input type="radio"/>				
Setting indicative or binding targets for certain bio-based products	<input type="radio"/>				
Developing appropriate regulations for the bioeconomy	<input type="radio"/>				
Public procurement	<input type="radio"/>				
Developing European (CEN) and International (ISO) standards for bio-based products	<input type="radio"/>				
Harmonising certification and labelling schemes	<input type="radio"/>				
Others	<input type="radio"/>				

If "Other", please specify

## 11. Intra governmental communication

How would you assess the importance of the following measures to improve intra governmental communication within the emerging bioeconomy? Please rate on a scale from 1 (not important) to 5 (very important).

	1	2	3	4	5
Establishing high level working group(s) made up of central government department representatives	<input type="radio"/>				
Establishing multi-level working group(s) made up of central/regional/local government department representatives	<input type="radio"/>				
Developing better mechanisms for inter-departmental communication, e.g. cloud-based file sharing, regular internal updates	<input type="radio"/>				
Scheduling regular inter-departmental meetings to promote dialogue between them	<input type="radio"/>				
Others	<input type="radio"/>				

If "Others", please specify

## 12. Participative dialogue with the public and bioeconomy stakeholders

How would you assess the importance of the following measures to promote a participative dialogue with the public and bioeconomy stakeholders? Please rate on a scale from 1 (not important) to 5 (very important).

	1	2	3	4	5
Establishing working group(s) made up by public sector representatives and bioeconomy stakeholders	<input type="radio"/>				
Local/regional workshops attended by public sector representatives and bioeconomy stakeholders	<input type="radio"/>				
Developing a public-sector commercialisation outreach service (or similar), i.e. to promote public sector tenders, opportunities for partnership, etc	<input type="radio"/>				
Establishing national Knowledge Exchange Networks to promote information sharing between bioeconomy actors	<input type="radio"/>				
Better use of shared industry terminology between the public sector and bioeconomy stakeholders	<input type="radio"/>				
Introducing grant or loan-based financing schemes for public-private initiatives in the bioeconomy	<input type="radio"/>				
Others	<input type="radio"/>				

If "Others", please specify

### 13. Best practices

How would you assess the importance of the following measures to share best practices within the emerging bioeconomy? Please rate on a scale from 1 (not important) to 5 (very important).

	1	2	3	4	5
Establishing networks of best practice bioeconomy regions in Europe	<input type="radio"/>				
Introducing regulations, penalties and conclusive time limits to render the implementation of approved best practices compulsory	<input type="radio"/>				
Organising best practice workshops for information sharing	<input type="radio"/>				
Establishing online best practice databases	<input type="radio"/>				
Others	<input type="radio"/>				

If "Others", please specify

### 14. Ensuring appropriate financing

How would you assess the importance of the following measures to ensure appropriate financing within the emerging bioeconomy? Please rate on a scale from 1 (not important) to 5 (very important).

	1	2	3	4	5
Funding from national programmes for the bioeconomy	<input type="radio"/>				
Public funding for demonstration projects	<input type="radio"/>				
Promoting public private partnerships	<input type="radio"/>				
Ensuring competitive feedstock costs	<input type="radio"/>				
Implementing green public procurement	<input type="radio"/>				
Building investor confidence in the bioeconomy	<input type="radio"/>				
Others	<input type="radio"/>				

If "Others", please specify

## 15. Data on current energetic and material use of biomass

How would you assess the importance of the following measures to ensure appropriate data availability within the emerging bioeconomy? Please rate on a scale from 1 (not important) to 5 (very important).

	1	2	3	4	5
Information resource website(s), "gateway website" with links to other websites	<input type="radio"/>				
RSS feeds on bioeconomy topics	<input type="radio"/>				
Ontologies, taxonomies and Semantic Web	<input type="radio"/>				
Industry fora organised by trade/business/industry associations	<input type="radio"/>				
Industry fora led by public sector bodies	<input type="radio"/>				
Establishing national Knowledge Exchange Networks to promote information sharing between bioeconomy actors	<input type="radio"/>				
Unified mailing service which stakeholders can subscribe to in order to be kept informed with latest developments	<input type="radio"/>				
Others	<input type="radio"/>				

If "Others", please specify

## 16. Specialist personnel

How would you assess the importance of the following measures to ensure sufficient specialist personnel for the development of a strong and sustainable European bioeconomy? Please rate on a scale from 1 (not important) to 5 (very important).

	1	2	3	4	5
Developing national (and/or regional) industry skills policies and training programmes	<input type="radio"/>				
Grants for individuals to undertake specialist education and training	<input type="radio"/>				
International exchange programmes for students and entrepreneurs along the lines of Erasmus	<input type="radio"/>				
Grants to businesses to improve workers' specialist skills	<input type="radio"/>				
Additional funding to education/training bodies to provide relevant specialist education/training	<input type="radio"/>				
Increased funding for bioeconomy research	<input type="radio"/>				
Developing clearer academic qualification pathways for specialised roles	<input type="radio"/>				
Developing clearer vocational qualification pathways for specialised roles	<input type="radio"/>				
Public information and awareness efforts (e.g. better bioeconomy sector representation at Graduate Job Fairs)	<input type="radio"/>				
Support for new bioeconomy-skilled migrants, especially for non-EU migrants (e.g. work permits, green cards)	<input type="radio"/>				
Others	<input type="radio"/>				

If "Others", please specify

## \* 17. Contact details

Name:

\* Affiliation:

Telephone:

Email:

(multiple choices are allowed)

- I would like to be informed of the outcome of this consultation.
- I am available for a follow-up phone interview.
- I am interested to receive further information on BioSTEP policy workshops.
- I am interested to take part in other activities related to BioSTEP.

For more information about the BioSTEP project please visit our website at <http://www.bio-step.eu>