RESULTS OF THE JRC-SCAR BIOECONOMY SURVEY

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Table of contents

1. INTRODUCTION

Unprecedented and unsustainable exploitation of natural resources, potentially irreversible changes in the global climate and the lack of ability to stop the loss of biodiversity form a serious threat to the biological basis of the European society. Over the next decades, the global population is expected to increase to exceed 9 billion in 2050. These complex and inter-connected challenges will need to be addressed by an integrated and effective policy combined by an extended programme for scientific research and innovation in order to facilitate sustained changes in lifestyle and resource use across all levels of the economy.

In order to be able to cope with increasing global population, (over)exploitation of natural resources, increasing environmental pressure and climate change, Europe has to change the way it is organising the production, consumption, processing and recovering of its biological feedstocks. The bioeconomy has been proposed as a key element of a smart and green development path. Advancements in bioeconomy research and innovation uptake will facilitate the improved management of biological resources and the opening and development of diverse food and bio-based markets.

Bioeconomy has been defined in the European Commission's COM(2012)60 as:

> "The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge"[1]

There are many possible reasons for a country to engage in the Bioeconomy. Driving forces for Bioeconomy policy may be merely political – to realise policy existing or newly defined objectives, economic – to stimulate existing economic performance, and/or to generate new market power, as well as oriented towards realisation of environmental objectives – for example, to reduce waste, or Greenhouse Gas emissions, and help improve environmental quality.

Bioeconomy is the field where all types of biomass uses are coming together and links to all biomass uses may be found (Figure 1.1). The actual link between different sectors in practice is, however, relatively small. In the connecting field, competition may occur between biomass generating sectors – which, in principle, may be mutually replacing each other – and biomass converting sectors – which may compete for available feedstocks.

[1] Source: Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

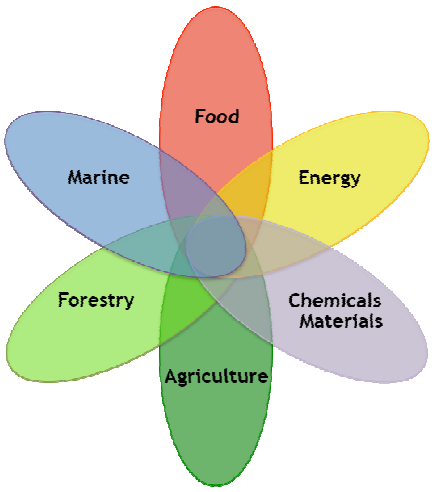

Figure 1.1. Fields covered in the Bioeconomy
Source: European Commission (2014)[2]

All Bioeconomy areas already have their own strategy, actions and innovation. Focussed action in research and policy is needed to use them to address major basic challenges that are prevalent in the current research and policy agenda's. By using a cross-sectoral approach, bioeconomy areas can be linked in an effective way to develop new, innovative research areas, and enhance policy coherence. The development of a good connectivity between individual areas is a prerequisite for effective bioeconomy development.

Establishing a bioeconomy can boost economic growth and jobs in rural, coastal and industrial areas, reduce fossil fuel dependence and improve the economic and environmental sustainability of primary production and processing.

The Bioeconomy Strategy and Action Plan presented in a 2012 Communication on Bioeconomy aims to facilitate the development of an innovative, resource efficient, sustainable and competitive use of biological resources, reconciling their exploitation for industrial purposes with food security while providing sufficient environmental safeguards. Under Action N° 6 of the Bioeconomy Action Plan consists in establishing a Bioeconomy Observatory.

The establishment of the Observatory is part of the implementation of the EU Bioeconomy Strategy and Action Plan laid down in the European Commission Communication on Bioeconomy of February 2012 (COM(2012)60)[3]. Objective of the action plan is to emphasise the importance of the bioeconomy for Europe in addressing major societal and economic challenges and to create a more favourable environment for its realisation.

The Bioeconomy Observatory, as the Strategy does, focuses on three main pillars (Figure 1.2):

- "Research" (investments in Research, Innovation and Skills)

[2] European Commission (2014). Where next for the European Bioeconomy? Brussels, Directorate-General for Research and Innovation
http://ec.europa.eu/research/bioeconomy/pdf/where-next-for-european-bioeconomy-report-0809102014_en.pdf
[3] Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

- "Policy" (reinforced policy interaction and stakeholder engagement)
- "Markets" (enhancement of markets and competitiveness in bioeconomy)

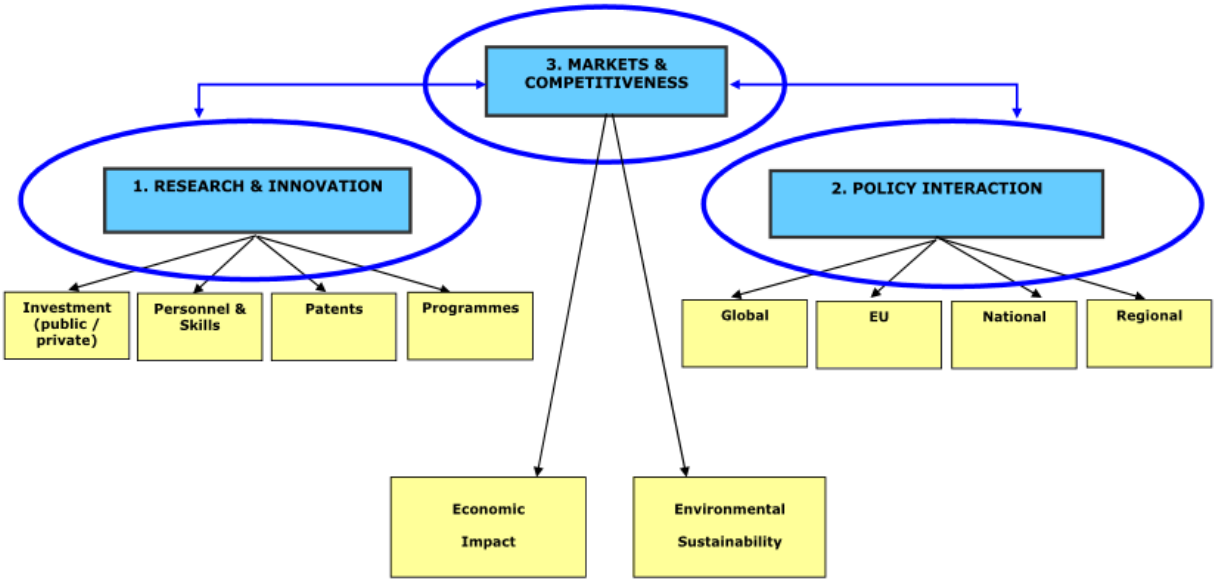

Figure 1.2 Three pillars of the Bioeconomy Information System Observatory (BISO) project[4]

The Joint Research Centre (JRC) is in charge of setting up the Bioeconomy Observatory, in close collaboration with existing information systems that allows the Commission to regularly assess the progress and impact of the bioeconomy and develop forward-looking and modelling tools. The project time line goes from the first quarter of 2013 until the first quarter of 2016; the project acronym is BISO (Bioeconomy Information System Observatory).

The establishment of the Bioeconomy Observatory is expected to support one of the major objectives of the EU Bioeconomy Strategy, which is "to contribute to achieve the full potential of the bioeconomy, by providing the knowledge base for a coherent policy framework and promoting relevant innovation activities, thereby giving specific support to markets and policies related to the bioeconomy".

Data collection and data analysis from the Bioeconomy Observatory will provide a solid basis for decision-making on the bioeconomy, in particular for policy-makers. The primary target audience for the Bioeconomy Observatory will be policy-makers (be it at EU or at national Member States level), who will be provided with comprehensive and authoritative data and information on bioeconomy.

Data and information collected about bioeconomy research, policy and markets will be available online through the BISO website. More specifically, key bioeconomy data and information collected at national level are summarised in a series of "national bioeconomy country profiles" for the EU-28 Member States which can be downloaded from the website (https://biobs.jrc.ec.europa.eu/policy).

[4] Source: Plan, D. (2013). The EU Bioeconomy Observatory. First stakeholders roundtable. 26th November 2013. Brussels. https://ec.europa.eu/jrc/sites/default/files/events/20131126-biso-roundtable/20131126-biso-roundtable-plan.pdf

In this way, Member States authorities are provided with comprehensive and authoritative data and information on bioeconomy. They are also key partners for the Observatory in terms of "supply" of national bioeconomy data and information to the Bioeconomy Observatory. In order to access, collect and confirm the accuracy of bioeconomy data and information gathered at national level, partnership between the Bioeconomy Observatory and the Member States remains crucial.

Partnership between the Bioeconomy Observatory and the Member States has been established through bilateral interaction with individual Member States authorities and through cooperation with the Standing Committee on Agricultural Research (SCAR) and in particular its Strategic Working Group on Sustainable use of Bio-resources for a Growing Bioeconomy (SBGB).

The Standing Committee on Agricultural Research (SCAR) of the European Union was established in 1974 by a Regulation of the Council of the EU. It is formed by representatives of Member States, and presided over by a representative of the Commission, who has a mandate to advise the Commission and the Member States on the coordination of agricultural research in Europe. It was given a renewed mandate in 2005 to play a major role in the coordination of agricultural research efforts across the European Research Area.

The Membership is composed by the 28 EU Member States, as well as representatives from Candidate and Associated Countries as observers. The SCAR members currently represent 37 countries. Since 2005, more than 20 working groups have been set up by European countries engaging voluntarily and on a variable-geometry basis in the definition, development and implementation of common research agendas based on a common vision of how to address major challenges in the field of agricultural research.[5]

In 2013, SCAR and DG-JRC decided to join forces in the development of a survey to collect essential data on national Bioeconomy policies, legal status of Bioeconomy development and national as well as regional/cluster R&D initiatives and public R&D funding. Together, DG-JRC and SCAR could provide a broad link to existing policies as well as R&D practices in the field of both classical and emerging Bioeconomy sectorial developments.

The common "Bioeconomy Member States survey" was run in 2014 aiming to collect information on the bioeconomy at individual national Member State level, with a particular focus on national research activities and policy initiatives for the bioeconomy. Biomass Research has provided support in the implementation and analysis of the survey. The general objective was to collect at individual Member State level and (on the basis of a preliminary questionnaire prepared by the JRC and SCAR) quantitative data and qualitative information on bioeconomy. In the survey, there was a particular focus on national bioeconomy research activities and national bioeconomy policy initiatives.

Biomass Research has worked in close collaboration with both the DG JRC and SCAR, in particular with the chair of its Strategic Working Group on Sustainable use of Bio-resources for a Growing Bioeconomy (SBGB). Data and information have been collected through "national survey contact points" who received (and often returned) a questionnaire.

[5] http://ec.europa.eu/research/agriculture/scar/groups_en.htm

The current report presents an overview of the main results of the survey, as they have been used to be incorporated to national files presented on the Bioeconomy Observatory website. It contains the following elements: the questionnaire is introduced in Chapter 2; main results of the survey are presented in Chapter 3, which is followed by a discussion (Chapter 4); and the individual questionnaires are presented in the Annexes.

2. METHODOLOGY AND QUESTIONNAIRE

A questionnaire was developed including six questions and several sub-questions, organised in two sections. In the first section, questions were oriented towards existence and character of national Bioeconomy policies. The second section focused on national Research and Development.

An overview of the questions is presented in Table 2.1. Many questions were open or offering plenty room for explanation and additional descriptions. Priority rankings were asked related to the main drivers to engage in the Bioeconomy (Question 2) and to the perceived benefits of research cooperation initiatives in the EU (Question 6). National policies, existing Bioeconomy regions and clusters and R&D projects could be listed. Question 4 requested annual public funding budgets for different types of Bioeconomy related research.

Table 2.1 Overview of questions of the JRC-SCAR Bioeconomy survey

Question	Subject	Type
1	Definition of Bioeconomy implemented in national policy documents. Comparison to definition used by the European Commission	Open
2	Main drivers to engage in the Bioeconomy	Priority ranking
3a	National policy strategies covering Bioeconomy	Yes/no + explanation
3b	Identification of national Bioeconomy policies	Yes/no + description, links
3c	Bioeconomy regions and clusters	Listing
4	Bioeconomy R&D programmes	Listing + explanation, public budget
5	Bioeconomy research and innovation projects	Listing + description
6	Benefit of European research cooperation	Ranking + listing existing programmes

An overview of the questionnaire is presented in Annexe 1.

The survey and a first draft of the questionnaire were presented to members of the SCAR Strategic Working group on Sustainable Bioresources for a Growing Bioeconomy, during its meeting in the Hague on June 13, 2014. Feedback on the preliminary setup was received and elaborated in the process of the finalisation of the questionnaire.

The final questionnaire was sent out to national SCAR contact points together with a personal introduction letter on June 20. The intended first deadline was August, 15. This deadline was later extended to September, 1, 2014. An overview of the contact points involved in the survey is presented in Annex 2.

Submissions were received from Belgium, Switzerland, Czech Republic, Germany, Denmark, Estonia, Spain, Finland, France, Hungary, Ireland, Israel, Italy, Latvia, the Netherlands, Norway, Sweden, Slovenia, Turkey and the United Kingdom. Belgium submitted two questionnaires, one for each major region. Italy used the framework for an old questionnaire. The questionnaire by Latvia was received late.

3. RESULTS

Survey participation

A total of 21 countries responded to the survey (Figure 3.1). Of them, 20 submitted a questionnaire, 17 Member States (Belgium, Czech Republic, Germany, Denmark, Estonia, Spain, Finland, France, Hungary, Ireland, Italy, Latvia, the Netherlands, Sweden, Slovenia, and the United Kingdom), and four non-Member States (Switzerland, Israel, Norway, and Turkey). One country (Slovak Republic) announced that submission was intended. Belgium submitted two questionnaires, one for Flanders and one for Wallonia.

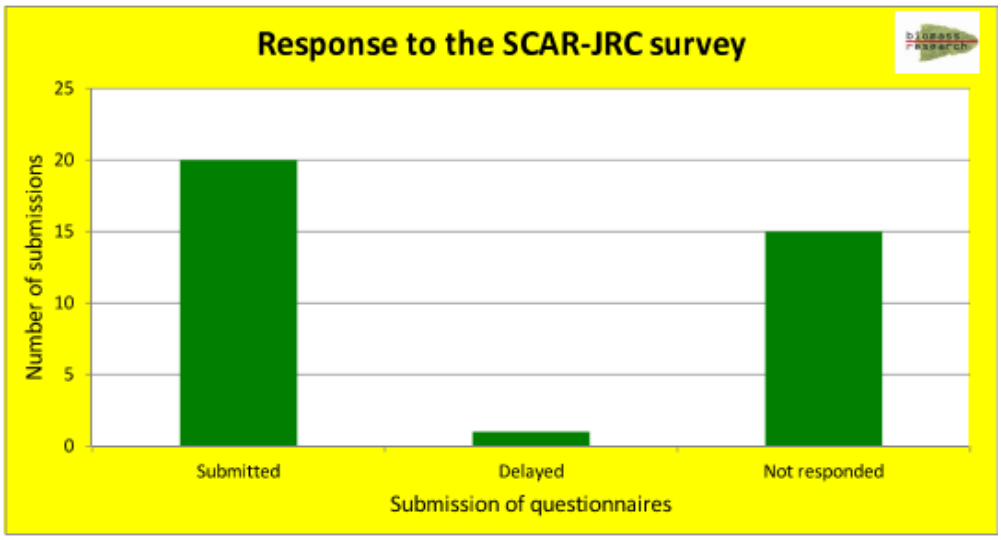

Figure 3.1 Questionnaire submission

Not all questionnaires were complete. Italy used an old format, and did not provide answers to all questions. Other countries missed questions as well (Figure 3.2).

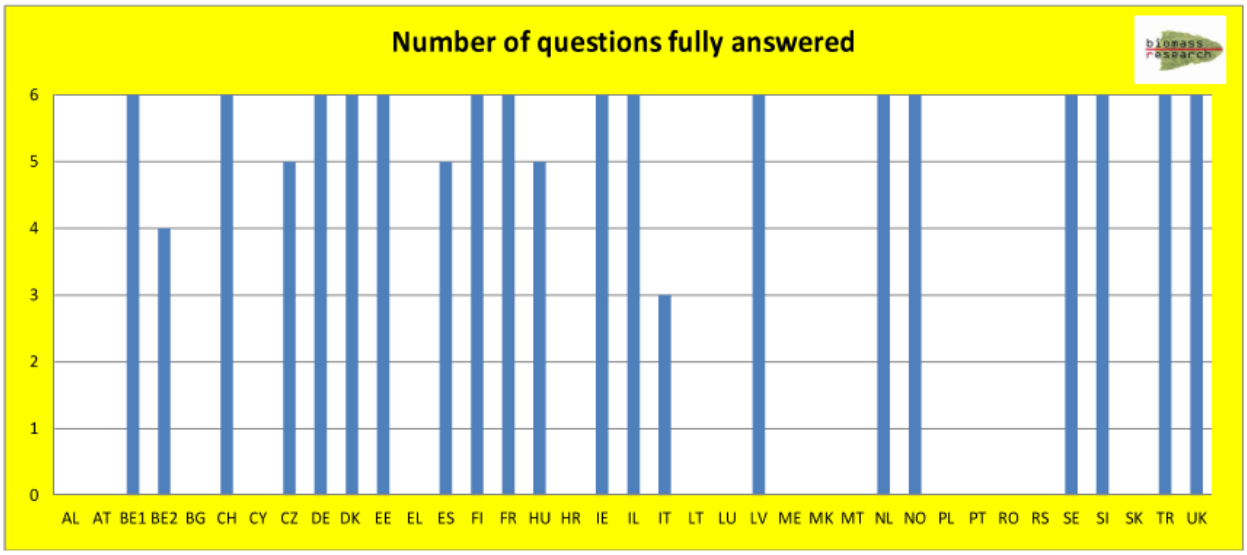

Figure 3.2 Number of questions that were fully answered

Question 1: Bioeconomy policy and definition

Twelve countries (60%) use a definition for the Bioeconomy that is more or less similar to the definition used by the European Commission (Figure 3.3). Among Member States that submitted the questionnaire, ten (63%) have a similar definition to the one used by the Commission. Most of the other countries do not use a definition.

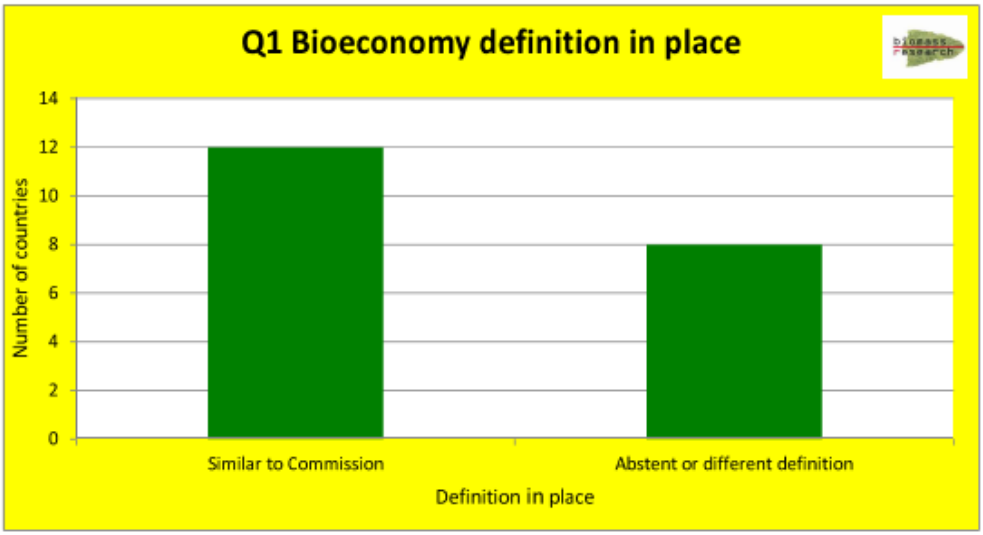

Figure 3.3 Bioeconomy definition resemblance with the Commission's definition

Question 2: Drivers to implement a Bioeconomy policy

Reasons to implement Bioeconomy policy are related to factors with a merely political, economic, or environmental character. The average ranking of 20 submissions shows priority of individual drivers ranges between 3.0 and 4.5. Economic drivers are given a higher average score (4.3) than political (average score 3.7) and environmental objectives (average 3.5). Hence, the development of a Bioeconomy policy is seen as an opportunity to enhance economic development, including both classic and new Bioeconomy sectors, while food security and the need to combat climate change are also relevant (Figure 3.4).

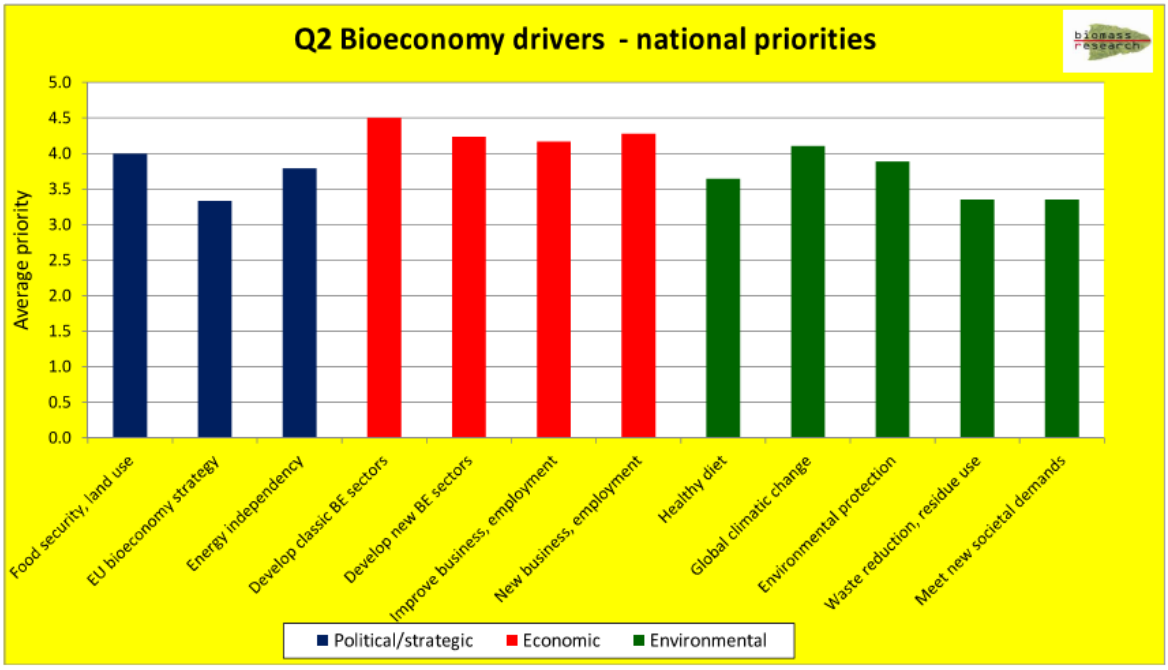

Figure 3.4 Drivers to develop a Bioeconomy strategy

Question 3: National policy strategies

Nine countries are implementing a Bioeconomy strategy (Figure 3.5). Flanders, Germany, Finland and Sweden have developed a full strategy; Switzerland, Denmark, Estonia, the Netherlands and Wallonia implement a partial strategy.

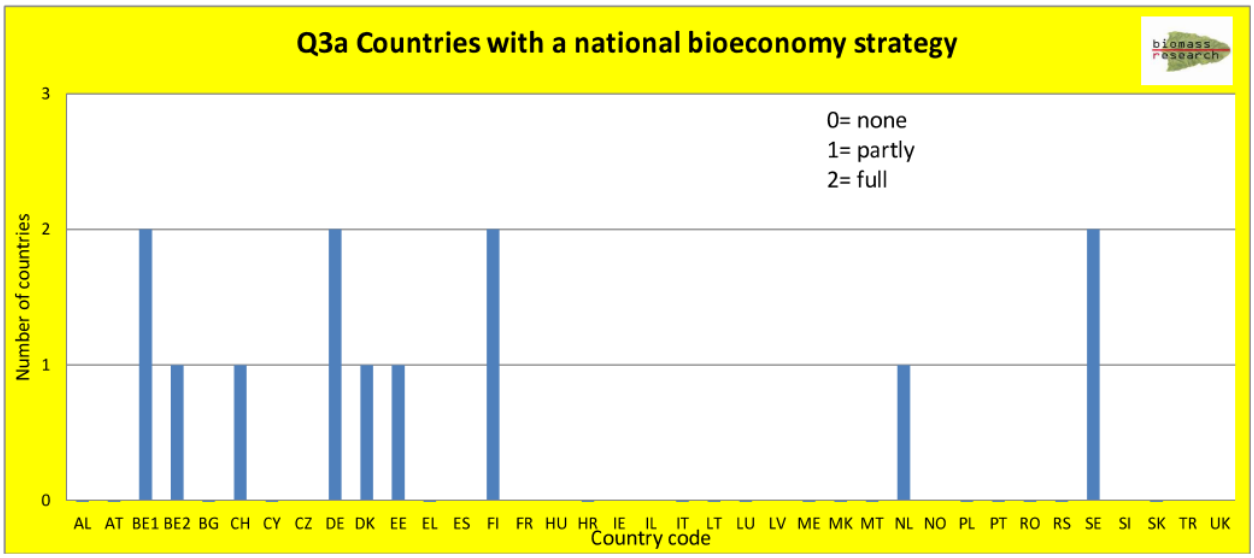

Figure 3.5 Countries with a Bioeconomy strategy

Five countries (Germany, Estonia, Finland, Hungary and the Netherlands) have installed a national Bioeconomy Agency. In most cases, two ministries are (jointly) in charge of the implementation of the Bioeconomy strategy (Figure 3.6).

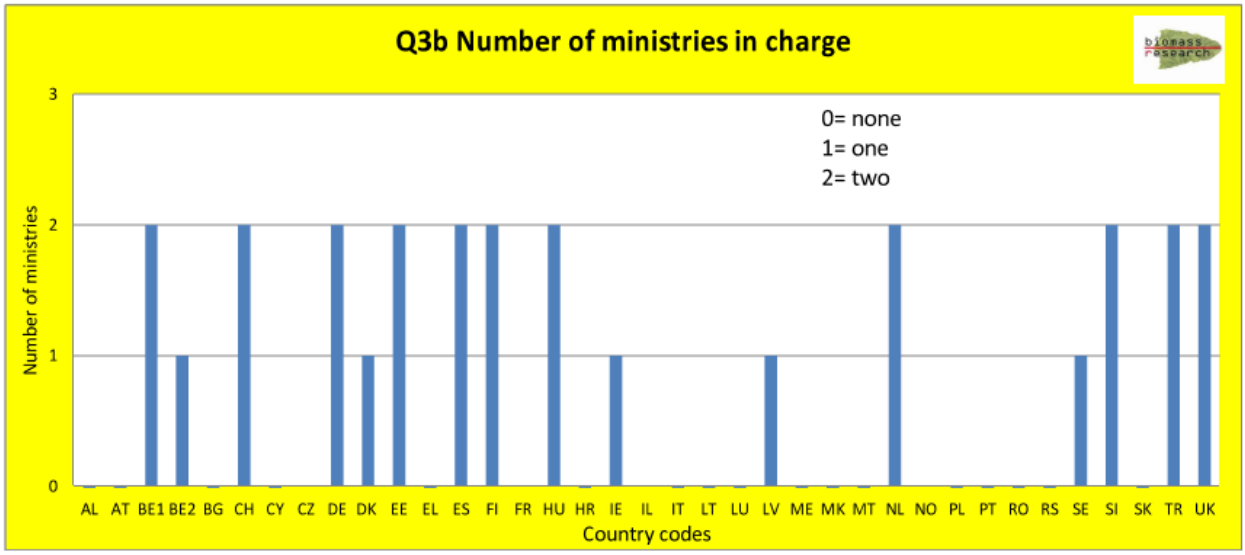

Figure 3.6 Number of ministries in charge of the Bioeconomy strategy

Question 4: Bioeconomy related R&D programmes

The budget for R & D programmes in the bioeconomy receives some 2.3 billion of public funds[6]. This amount is based on the questionnaires that were submitted and cannot be considered as fully representative for countries that did not submit any details on their information. Details of the funding of bioeconomy research & development programmes are presented in Table 3.1. Agriculture is the sector receiving most of the R & D funding. It annually receives 1.3 billion Euro which is more than half of all reported public funding. Industrial use of biomass receives 185 million Euro's (8%); while 185 million Euro is allocated to energy use; marine, fisheries and aquaculture receive 172 million Euro's (7%). A relatively small amount is designated to generic bioeconomy programs (6%).

Table 3.1 Bioeconomy related national research budgets

Sector / activity	**Budget [1]**	**Share of total budget [2]**
Generic Bioeconomy [a]	136	5.8%
Agriculture	1,344	57.5%
Forestry	10	0.4%
Marine, fisheries, aquaculture	172	7.4%
Waste as biomass sources	58	2.5%
Food and feed use of biomass (food/feed value chains)	27	1.2%
Energy use of biomass (bioenergy)	185	7.9%
Industrial uses of biomass [b]	196	8.4%
Key enabling technology (industrial biotechnology)	54	2.3%
Communication, stakeholder involvement	0	0.0%
Other (please specify)	155	6.6%
All	2,338	100.0%

[a] Covering several elements and sectors of the bioeconomy; [b] Including paper and pulp, wood and wood products, chemical production, pharmaceutical production, and other industrial uses.

[6] Only funds from research programmes, no budgets from structural or innovation funds were reported.

Question 5: Case-studies of Bioeconomy related research and innovation projects

More than 100 case-studies of successful Bioeconomy development have been reported. Nearly half of them were listed by Germany. Large numbers of case-studies were also reported by Flanders, Germany, Denmark and the UK. An overview of the number of case studies reported is given in Figure 3.7.

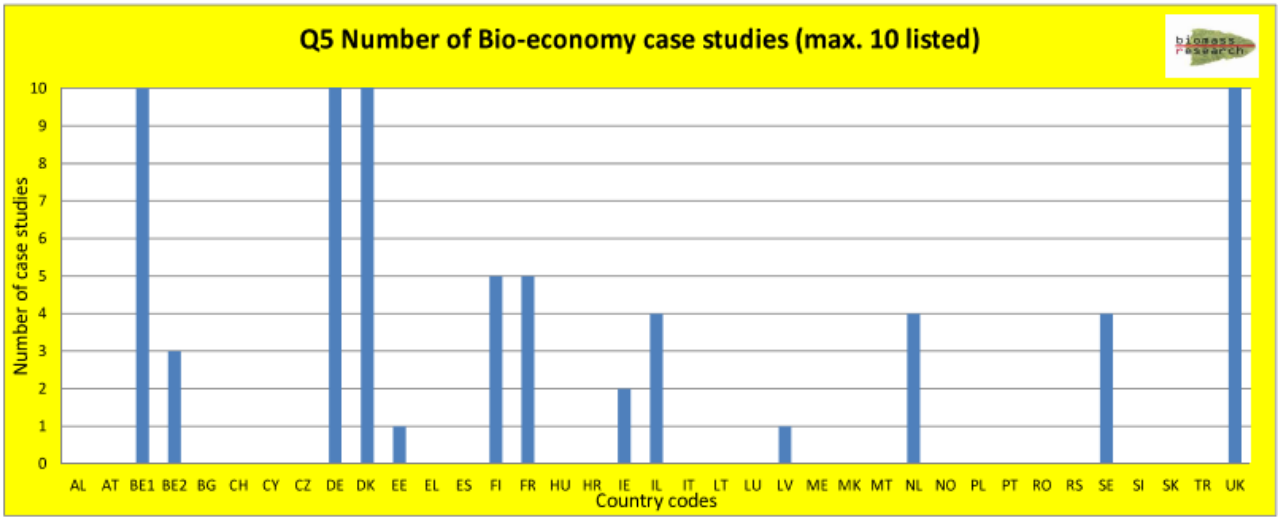

Figure 3.7 Number of case studies reported[7]

Question 6: Bioeconomy transnational R&D collaboration

The participating countries see large (potential) benefits of participation in international R&D programmes related to the Bioeconomy, although in many cases countries find it difficult to assess priority. Table 3.2 presents an overview of rankings allocated to individual elements. The lowest ranking (1) was not given. Most frequent were the highest rankings (4 and 5).

Table 3.2 Rankings reported on perceived benefits of transnational R & D collaboration

Ranking **Sector / activity**	**1**	**2**	**3**	**4**	**5**	**All**
Food security	0	1	0	6	6	13
Policy framework	0	0	2	5	3	10
Bioenergy	0	0	5	2	4	11
Social inclusion	0	0	4	2	2	8
Economic, market framework	0	0	3	3	5	11
Knowledge, practices transfer	0	0	1	8	4	13
Resource efficiency	0	0	2	5	5	12
Biorefineries	0	1	2	4	4	10
Algae	0	1	2	2	1	11
Animal feed	0	1	4	5	0	6
Healthy food research	0	1	1	5	5	12
Sustainability criteria	0	0	1	3	9	13
Genetics	0	1	2	5	4	12
Renewable resources	0	1	3	3	4	11
Footprint methodology	0	1	1	3	3	8
All	0	8	33	63	61	4

[7] For the sake of conciseness, a maximum of ten case are presented studies per country

Average ranking scores per element were high, ranging between 3.5 and 4.6. Highest scores were given to research on the development of sustainability criteria, and to research on biorefineries, food security, resource efficiency and knowledge transfer (Figure 3.8). Average scores for political/strategic and economic elements were similar (4.1). Scores for environmental elements were slightly higher (4.2).

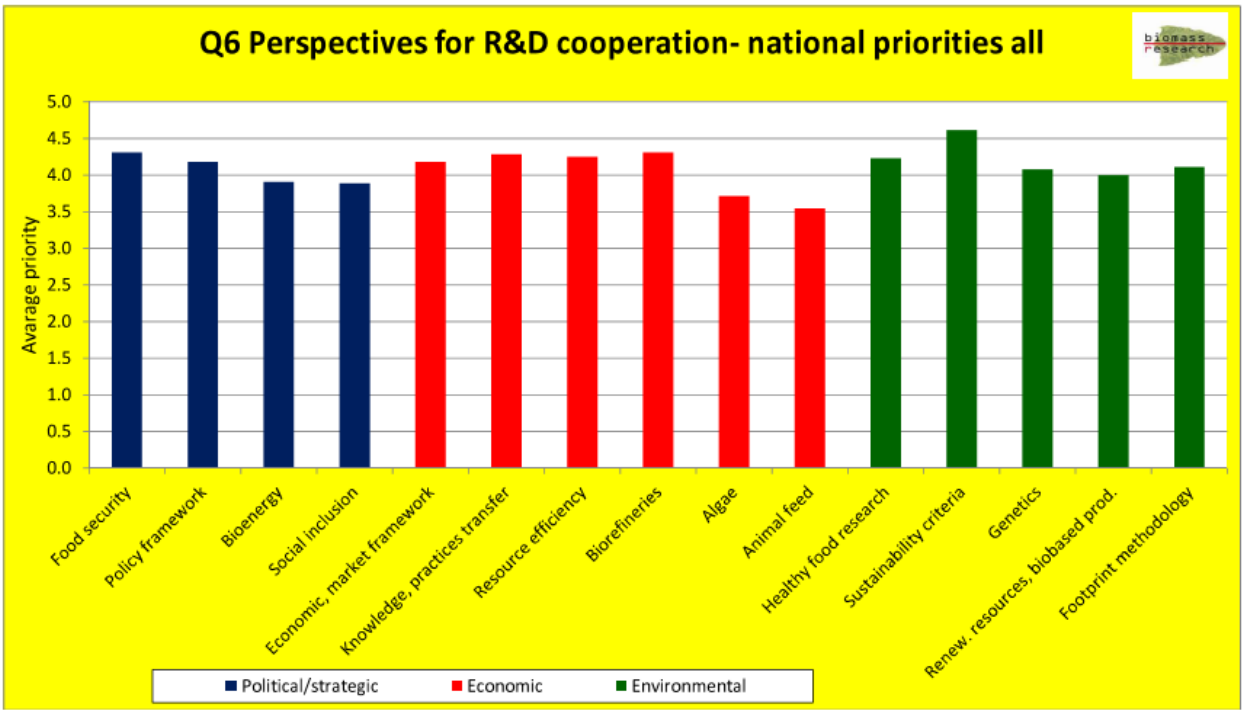

Figure 3.8 Perspective for international cooperation (all submissions)

A comparison between scores of Member States and non-Member States shows few differences. Member States generally give higher rankings, which suggests higher expectations of international cooperation. Environmental elements are given the highest ranking (Figure 3.9).

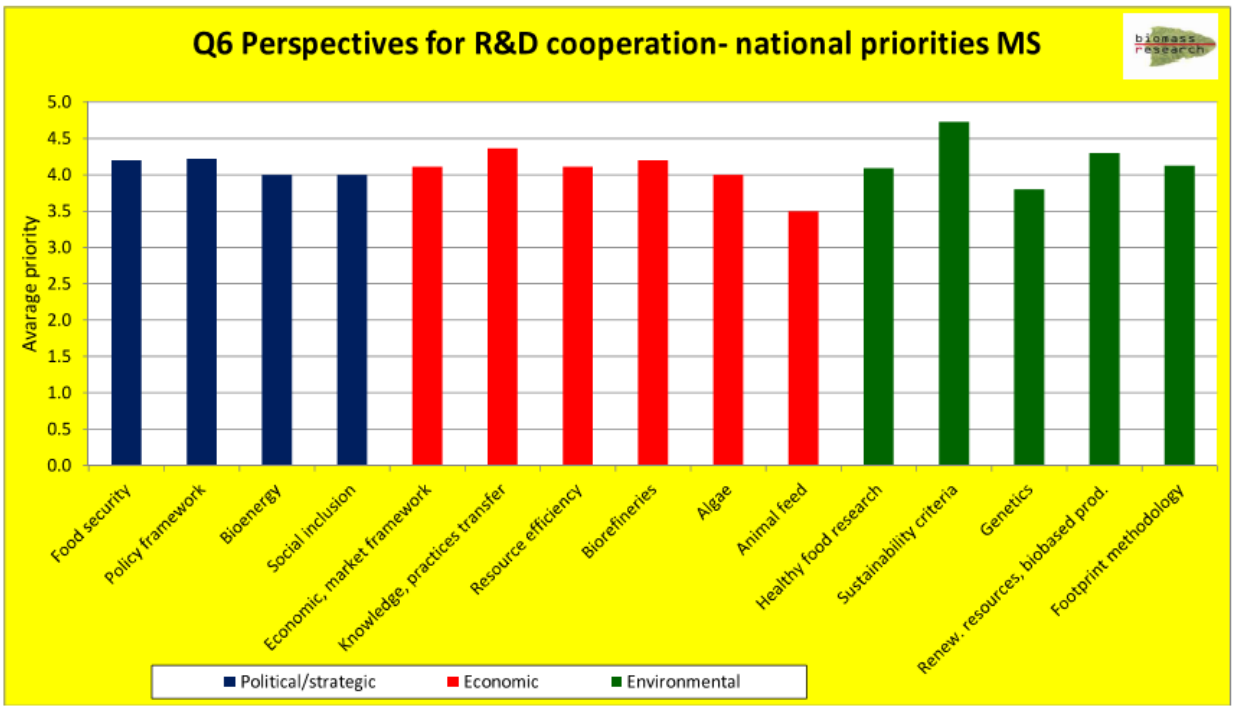

Figure 3.9 Perspective for international cooperation (Member States only)

4. DISCUSSION AND CONCLUSION

Following an active policy towards the development of a strong and effective Bioeconomy in the EU, the European Commission is working towards the establishment of a Bioeconomy Observatory. The development of the BISO project is supported by a "Bioeconomy Member States survey" to collect information on the bioeconomy at individual Member State level national, with a particular focus on national research activities and policy initiatives for the bioeconomy. A SCAR (Standing Committee on Agricultural Research) member list has been used to identify national contact points in 28 European nations including all EU Member States.

Each of the contact points was approached, requesting collaboration in the distribution and/or filling of the questionnaire in their home country. In most cases, the questionnaire was redirected to the responsible ministries as requested. Sometimes, a new contact point had to be approached. General response to the request was positive, with more than half of the countries submitting a questionnaire within the requested period which included the summer period of 2014.

The response was higher than previously was anticipated, which suggests that the right forum has been used to address issues of Bioeconomy Observatory. Twenty countries have submitted a questionnaire; Belgium submitted two (one for each major region). The quality of the submitted questionnaires was high, often providing a lot of details related to policy, R&D and regional initiatives.

This does not mean that all countries have provided similar quality of answers. As a rule, countries already active in the development of a Bioeconomy policy and research framework (e.g. Germany, Denmark, Finland, Belgium, and The Netherlands) made a larger effort in preparing the answers to the survey. While, further, the response rate has been above expectations, it is recommended to approach countries that did not (yet) submit directly as the SCAR list of contact points is not likely to be the best opportunity to obtain the missing questionnaires.

Large differences exist with respect to the implementation of a Bioeconomy policy. A limited number of countries installed such a policy, a bioeconomy advisory board or an implementation agency. In some other cases, one or two ministries have been assigned the lead in the development of a Bioeconomy policy. Generally, a small number of countries seem to implement a full package (strategy, board, agency, policies, and dedicated R&D programmes).

There is, however, room for optimism. While Bioeconomy oriented policies and R&D infrastructure are developing, both at the national and the EU level many initiatives are taken. There is a substantial budget for Bioeconomy related research, with annual expenses exceeding 2.3 billion Euro.

A large number (108) of regional/cluster or national initiatives has been listed in the survey, and more may be expected. The recent publication of National Bioeconomy Profiles in the Bioeconomy Observatory (https://biobs.jrc.ec.europa.eu/), combining data from national and EU statistical bureau's with industrial key figures and data generated by the survey, is another milestone.

How, then, to evaluate these figures? We compare results presented above to a list of enabling fac-

tors for the development of new biotechnological innovations as presented by the Pugatch Consilium (2014)[8]. Enabling factors for innovative technological development include:

1. **Human capital** – A basic and fundamental building block is the availability of high skilled and technically trained human capital.

2. **Infrastructure for R&D** – R&D capacity is critical to fostering innovation and activity in high tech sectors including biotechnology and is reflected by country-level indicators including total R&D expenditure; patenting intensity; life science investment levels; public-private partnerships; and academic and scientific citations.

3. **Intellectual property protection** – Intellectual property rights such as patents and regulatory data protection are historically of real importance to the biotech and biopharmaceutical innovation process as they incentivise and support the research and development of new biological technologies and products.

4. **Regulatory environment** – The regulatory and clinical environment in a given country plays a significant role in shaping incentives for innovation and establishing adequate levels of quality and safety for biotech products, particularly biopharmaceuticals.

5. **Technology transfer frameworks** – Technology transfer is an important mechanism for the commercialisation and transfer of research from public and governmental bodies allowing private entities to develop commercially applicable technologies.

6. **Market and commercial incentives** – Market and commercial incentives can be realised *via* different formats including as tax incentives, support for basic research and R&D credits for investments in plant, equipment and other R&D infrastructure.

7. **Legal certainty** (including the rule of law) – The general legal environment as it relates to the rule of law including legal business context is crucial to commercialization and business activities.

Five of the enabling factors are addressed by the survey: human capital, R&D infrastructure, the regulatory environment, technology transfers, and legal certainty. Market incentives are not addressed directly, but it may be expected that emphasis on a proper legal framework and – especially – budgets for Research & Development, as well as international cooperation in R&D, help to develop an environment where economic conditions for commercial development is favourable. The survey provides a good coverage of the factors that need to be addressed in the Bioeconomy.

The recommendations presented by Pugatch with respect to technology development are in line with results of other studies. Compare, for example, to a listing by the Milken Institute (2013)[9].
According to this study, prequisites for bioeconomy development in the USA include:

- Consistent government policies
- 'Green banks'

[8] Pugatch (2014). The bioeconomy. http://www.pugatch-consilium.com/reports/Building_The_Bioeconomy_PugatchConsiliumApril%202014DD.pdf . Accessed 12 June 2014

[9] Milken Institute (2013). Financial Innovations Lab Report. Unleashing the power of the Bio-Economy.

- Public, private procurement programs
- Legel regulatory playing field
- Use agricultural, rural development programs
- CAP, Cohesian funds
- Use existing infrastructure

The list provided by Pugatch is also in line findings of other theoretical frameworks like the *Functions of Innovation Systems Theory*[10], that was developed for analysing the implementation of innovations in the Netherlands. As a rule, succesful innovations require a combination of availability of robust technology development, knowledge diffusion, enterpreneurship, availability of credit, market development and political frameworks (Langeveld 2010[11]).

Not all elements are equally well covered in the JRC-SCAR survey or – more in general – the Bioeconomy Observatory. Basically, these focus on the identification of the Bioeconomy as a strategic development area, the stimulation of national Bioeconomy strategies, the measurement and evaluation of performance including the identification of best practices, the leverage of national capabilities and enhancement of international cooperation.

[10] Hekkert, M., Negro, S., Heimeriks, G. and Harmsen, R. (2011). Technological Innovation Systems Analysis. A manual for analysts. Utrecht, Copernicus Institute for Sustainable Development and Innovation.

[11] Langeveld, J.W.A., Kalf, R. and Elbersen, H.W. (2010) Bioenergy production chain development in the Netherlands: key factors for success. Biofuels, Bioprod. Bioref. 4:484–493. DOI: 10.1002/bbb.240

ANNEXES

ANNEXE 1 SURVEY

Joint Survey on National Bioeconomy Strategies

Country:	
Year of data collection:	
Contact mail person in charge of data collection:	

This survey consist of two parts. It is aimed to collect data on:

(1) National Bioeconomy Policies and
(2) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

Please describe where your country's definition is different from the EU definition of the bioeconomy.[12]

[12] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY

Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy

	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy		
Food security/ land-use competition		
Healthy diet		
Independence from fossil resources/security of supply		
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)		
Development of new bioeconomy sectors (bioenergy, industrial biobased products)		
Maintaining business base and employment		
New business, increased employment		
Mitigation of climate change/adaptation to climate change		
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)		
Resource efficient economy (reduction of waste, use of residues)		
Societal demand		

Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?		
Ministry(ies) in charge of the Bioeconomy strategy ?		
Does your country have a Bioeconomy advisory body/panel ?		
Does your country have a Bioeconomy agency or agencies ?		
Does your country have a Bioeconomy observatory collecting data/info ?		
Does your country have a Bioeconomy National Contact point ?		

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for down-load[13]
Agriculture			
Forestry			
Marine/Fisheries/Aquaculture			
Waste			
Agri-Food & Food security			
Food, Healthy diet			
Research & Innovation			
Green Growth Strategy			
Blue Growth Strategy			
Energy, including Bioenergy			
Industry, Enterprise			
Environment (incl. resource efficiency, sustainability, water use)			
Eco-System Services			
Regional development and Smart Spe-cialisation			
Education/Skills			
Other areas, please specify			

[13] Please provide English link (if available)

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[14]	**Link**[15]

[14] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[15] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture			
Forestry			
Marine/Fisheries/Aquaculture			
Waste as Biomass source			
Food/feed use of biomass (food/feed value chains)			
Energy use of biomass (bioenergy)			
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**			
Key Enabling Technology (Industrial Biotechnology)			
Communication, stakeholder involvement			
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions			
Resource efficiency			
Renewable resources/ bio-based products			
Knowledge transfer and good practice and innovation			
Economic/ market framework			
Policy framework			
Healthy food research			
Bioenergy			
Animal feed			
Development of an agreed methodology for environmental footprints			
Biorefineries			
Food security			
Social inclusion			
Algae			
Genetics			
Other areas, please specify			

ANNEXE 2 SCAR NATIONAL CONTACTS

SCAR Members List - June 2014			
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ANNEXE 3 RESULTS BY COUNTRY

BE - BELGIUM: FLANDERS

Joint Survey on National Bioeconomy Strategies

Country:	**Belgium – Flemish region**
Year of data collection:	2014
Contact mail person in charge of data collection:	Flanders: eva.vanbuggenhout@lv.vlaanderen.be

This survey consist of two parts. It is aimed to collect data on:
(3) National Bioeconomy Policies and
(4) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

Yes, definition: Bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bio-energy. Following sectors are included: agriculture, forestry, fisheries, food, wood industry, pulp and paper industry, environment technical sector, building and infrastructure, energy and industrial sectors as textile, chemistry (also containing pharmaceutical sector) and bio-technology. Finally the end user/consumer and logistics sector (recycling and waste recovery) can be added. In short, the bioeconomy encompasses all activities linked to the production of biomass, and the different ways how this biomass and residuals are used.
The biobased economy is part of the bioeconomy. According to this definition, the biobased economy encompasses the conversion of biomass into biobased products and materials.

Please describe where your country's definition is different from the EU definition of the bioeconomy.[16]

The European definition does not make a difference between biobased economy and bioeconomy as such.

[16] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	3	
Food security/ land-use competition	4	
Healthy diet	1	
Independence from fossil resources/security of supply	3	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	4	
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	4	
Maintaining business base and employment	4	
New business, increased employment	4	
Mitigation of climate change/adaptation to climate change	3	
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	4	
Resource efficient economy (reduction of waste, use of residues)	5	
Societal demand	2	
Other drivers – please specify	4	Enforcing the R&D potential, this follows ‘maintaining business base and employment’

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	Yes ~~/ No~~	Name of the strategy: Bio-economy in Flanders: the vision and strategy of the Government of Flanders for a sustainable and competitive bio-economy in 2030 Link: http://www.vlaanderen.be/nl/publicaties/detail/bioeconomy-in-flanders
Ministry(ies) in charge of the Bioeconomy strategy ?	Yes ~~/ No~~	Name of the responsible Ministry/ Ministries: the strategy is a joined effort of the **interministerial working group**. Several entities of different policy domains are actively involved: Economy, Science and Innovation; Agriculture and Fisheries; Environment, Nature and Energy; Education and Training and Work and Social Economy. Link: http://www.linkedin.com/groups/Bioeconomie-in-Vlaanderen-Bioeconomy-in-8131126
Does your country have a Bioeconomy advisory body/panel ?	~~Yes /~~ No	Name of the body: Flanders doesn't have a bioeconomy advisory body/panel/agency as such. We do have an Interministerial Working Group Bio-economy. Link:
Does your country have a Bioeconomy agency or agencies ?	~~Yes /~~ No	Name of the agency: Link:
Does your country have a Bioeconomy observatory collecting data/info ?	~~Yes /~~ No	Name of the body: Information on biomass is collected but this done in a fragmented way (different organisations, projects, … involved) Every two years, OVAM (Public Waste Agency) publishes a biomass inventory. OVAM also developed the food waste plug-in. Link: Biomass inventory 2011-2012: http://www.ovam.be/sites/default/files/Inventaris%20Biomassa%202011-2012_0.pdf Food waste plug-in: data will be available through Eurostat in the future.
Does your country have a Bioeconomy National Contact point ?	Yes ~~/ No~~	Name: Inge Arents. A more general contact point is the chair of the Interministerial Working Group Bio-economy (Chair is rotating – currently the Department of Agriculture and Fisheries has the chair – see contact details first page of this survey) Contact: iar@iwt.be

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[17]
Agriculture	Yes / ~~No~~	Agriculture delivers most of the products on which bioeconomy is based and throughout the production and processing cycle of agricultural products many fine examples of resource efficiency and recycling can be found. There is no explicit bioeconomy related policy in Agriculture Policy, but there are a number of implicit links to be found . There are measures within the new rural development programme (2014-2020) which are implicitly dedicated to bioeconomy e.g. funding for agroforestry. The RD programme was submitted to the European Commission in April 2014 and for its execution a total of 693 million euro is reserved. Under the new direct support measures, the greening measures may implicitly contribute to the bioeconomy.	
Forestry	Yes / ~~No~~	The Forestry Decree (13.06.1990) establishes a framework for sustainable forest management focussing on a sustainable balance between the economic, social, environmental and ecologic function of the forest. The KOBE projects (see Q4) are aimed at improving the net balance between management costs for and the benefits of ecosystem services (current focus on forestry and to a lesser extend on grassland).	
Marine/Fisheries/Aquaculture	Yes / ~~No~~	As in Agriculture, Fishery and Aquaculture provide nice examples of resource efficient production and recycling: The discard ban and full landing obligation in the new Common Fishery Policy could be considered as a “bioeconomy” policy initiative. Aquaculture in closed circuit, integrated aquaculture where species live from waste of other species (mussels, seaweed, fish) , algae production for fuel, medicine, cosmetics, food supplement are examples of resource efficiency.	

[17] Please provide English link (if available)

Waste	Yes / ~~No~~	Action Plan biomass residues	
Agri-Food & Food security	Yes / ~~No~~	Cascading use of food waste that could not be prevented towards different applications. In close collaboration with the private sector (declaration of commitment).	
Food, Healthy diet	~~Yes /~~ No		
Research & Innovation	Yes / No	Innovaton Centre Flanders: innovation studies have been carried out around sutainable chemistry, green energy and eco-innovation	
Green Growth Strategy	~~Yes~~ / No[18]		
Blue Growth Strategy	~~Yes~~ / No		
Energy, including Bioenergy	Yes ~~/ No~~	The Energy agency is working on a Flemish action plan renewable energy by 2020, together with different stakeholders. One action is dedicated to guaranteeing the coherence between the action plan and the Flemish bioeconomy strategy and action plan. The Flemish action plan renewable energy will also cover the use and sustainability of the available biomass and the search for the most valuable aplliance for each energy source. The cascading principle is already in force for wood. Wood used as material is excluded from financial support for renewable energy.	
Industry, Enterprise	Yes ~~/ No~~	New Industrial Policy, Smart specialisation strategy: no particular bioeconomy strategy, but a programme 'Factory-of-the-future' with FISCH – Flanders Innovation Hub for Sustainable Chemistry	http://www.fi-sch.be/
Environment (incl. resource efficiency, sustainability, water use)	Yes / ~~No~~	The Government of Flanders has the ambition to belong to the top 5 European regions when it comes to sustainable materials management. To realise this, the Flanders' Materials Programme was launched in 2012 as part of 'Vlaanderen in Actie' (Flanders in Action). The Flanders' Materials Programme: transition project towards sustainable materials management in which government, industry, centres of expertise and civil society join	http://www.vlaamsmaterialenprogram-ma.be/documents/19/c3fb688b-77a1-4d9a-825d-f1aff24f5d67

[18] Although work is done on Green Growth, there is no Green Growth Strategy yet: http://www.vlaanderen.be/nl/publicaties/detail/maatschappelijk-verantwoord-ondernemen-en-groene-groei-springplanken-naar-duurzaamheid. http://www.lne.be/themas/beleid/milieueconomie/reguleringskosten

		forces.	
Eco-System Services	Yes / No	The ecosystem services concept (ESS) is included in several sectoral policies and in one way or another related to the bio-economy: The Environmental policy plan 2011-2015: “Introduction of the concept of ESS” is one of the 38 measures in this policy paper. The economy and community need a broad supply of ESS for sustainable development. Sample projects are being developed for areas offering various ESS. A network of expertise is also being developed. Flanders is developing quantity and quality tools based on this to support policy choices and/or determine and explain the confines of ecosystems.	Environmental policy plan 2011-2015 http://www.vlaanderen.be/nl/publicaties/detail/environmental-policy-plan-2011-2015-summary-1 NARA-T (http://www.nara.be/ecosysteemdienstenrapporten), only available in Dutch
Regional development and Smart Specialisation	Yes / ~~No~~	New Industrial Policy, Smart specialisation strategy:a general S3 strategy exists in Flanders but not for the bioeconomy: The trilateral programme BIG-C (Flanders, Netherlands, North-Rhine Westphalia) aims to develop the bioeconomy in the region through revitalising the chemical sector.	http://www.fi-sch.be/nl/nieuws/big-c-position-paper/
Education/Skills	Yes / ~~No~~	There is no specific policy for the bio-economy within the education field. Structural policy within the department of education may benefit the bioeconomy, as well as the execution of the STEM (Science, Technology, Engineering, Mathematics) action plan. There is also a project called Ecocampus which strives to be the catalysator for the orientation towards sustainable development within higher education. http://www.lne.be/doelgroepen/onderwijs/ecocampus	
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[19]	**Link**[20]
Ghent Bio Economy Valley/Harbour of Ghent	Ghent Bio-Economy Valley is a non-profit organisation supporting the development of biobased activities and resulting economic growth in the region of Ghent, Belgium. It is a joint initiative of Ghent University, the City of Ghent, the Port of Ghent, the Development Agency East-Flanders and a number of industrial companies related to the Ghent region that are active in the fields of generation, distribution, storage and use of biobased products and bio-energy. Ghent Bio-Economy Valley promotes the development of the biobased economy of the future through collaborative programs, joint initiatives and synergy creation between the partners in the fields of Research & Development, structural measures and policy, logistics and communication towards the general public. Ghent Bio-Economy Valley promotes the development of the biobased economy through: Technological innovation: building research and development expertise Cluster formation: building synergies between industrial partners Public awareness: improving public understanding through communication Provision of services: technological advice, partner matching, assistance with project proposal submission, … Within the Ghent Bio Economy Valley Bio Base Europe is Europe's first open innovation and education center for the biobased economy. Flanders and The Netherlands have joined forces to build state-of-the-art research and training facilities to speed up the economic growth, innovation capacity, and sustainable development of our society. Bio Base Europe consists of the Bio Base Europe Pilot Plant and the Bio Base Europe Training Cente. The Bio Base Europe Pilot Plant is a flexible and multipurpose pilot plant for biobased products and processes:	http://www.gbev.org/en

[19] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[20] Please provide English link (if available)

	• Biobased products and processes are developed and scaled up to production scale. • One-stop-shop: the complete bioprocesses can be performed, from biomass raw material to the pure and refined bioproduct. • Technologies include biorefining, biomass pretreatment, biocatalysis, fermentation, downstream processing and green chemistry. • Target group are companies and research institutes worldwide. • Confidentiality is guaranteed as the Bio Base Europe Pilot Plant is a fully independent facility. Focus: 1, 3 and 4	
BioVille	BioVille is a full service investor/incubator, located in Flanders, the heart of Europe with direct access to Belgium, the Netherlands, France Germany and the UK. As part of the venture capital group LRM and with the support of the Province of Limburg and Hasselt University the mission is to offer innovative life sciences companies and projects a dynamic and stimulating environment where entrepreneurs and scientists can develop and expand their ideas and technologies in order to accelerate the commercialization of medical innovations in Europe. BioVille provides state of the art office, laboratory and manufacturing facilities in combination with flexible financing modalities and supporting technical and business services to a broad spectrum of companies, ranging form start-ups, over later-stage growth companies to commercial organisation in the field of medical life sciences and biotechnology, ranging across drug development, cell therapy, diagnostics, medical devices and enabling technologies. Focus: 4	http://www.bioville.be/
FlandersBio	FlandersBio is the networking organisation for the life sciences sector in Flanders, a dynamic non-profit, fee-based organisation with currently more than 270 members. FlandersBio supports the life sciences community through networking, direct services and	http://flandersbio.be/

	advocacy to stimulate the growth of the sector and deliver long-term economic and social benefits in the region. The FlandersBio network brings together companies with innovative, R&D-driven activities in the life sciences – companies that are for example developing biopharmaceuticals, medical technologies or agricultural or industrial biotech products. The network welcomes companies with production activities based in Flanders as well as academic research institutes and providers of capital, services and technologies to the life sciences community. FlandersBio's strategic goals are: • Achieve sustainable economic growth • Stimulate knowledge transfer • Create a supportive regional environment • Ensure a sufficient talent pool • Increase public awareness Together, FlandersBio, GBEV and essenscia (chemical and life sciences sector association) have joined forces to further develop and support the industrial biotechnology with CINBIOS, "Cluster for Industrial Biotech Solutions".This synergetic cooperation involves the whole value chain and represents the major Flemish stakeholders in the field of industrial biotechnology. Focus: 4	*www.**cinbios**.be*
FISCH	Chemistry for Sustainability: FISCH identifies, stimulates and catalyzes innovations for sustainable chemistry in Flanders by supporting companies with the initiation and set up of innovation projects. How? By supporting project set up, promoting cooperation between companies, governments and research institutions, encouraging partnerships, knowledge clustering, etc. Focus 1 and 4	http://www.fi-sch.be/en/
Flanders' FOOD	Flanders' FOOD is a centre of competence and network organization. Its goal is to	http://www.flandersfood.com/about-

	strengthen the competitiveness of the Flemish Food Industry by providing them with the tools and knowledge to innovate more, better and faster. How? By providing companies with a scientific-technological platform that • allows them to participate in scientific reseach to meet new challenges and opportunities in an accessible manner; • gathers scientific knowledge and communicates it to the companies through newsletters, books, seminars, training and advice; • connects companies with a proper partner (research institutes, suppliers, …) to solve specific problems. Focus 1 and 2	flanders-food

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
	General Remark: Flemish R&D-funding schemes are in general open to all topics. The proposals should mainly follow the scheme's logic when applying for funding. There are a number of programmes which can be linked to the bioeconomy but are not specifically designed for the development of the bioeconomy.		
Agriculture	Landbouw LA-trajecten	Applied research programme. The aim is to develop innovations that can benefit the farm sector or certain subsectors. It is an open programme, link with bioeconomy possible, but not mandatory.	10,3 million/year
Forestry	KOBE (ANB)	The KOBE projects, initiated by ANB and Inverde, are aimed at improving the net balance between management costs for and the benefits of ecosystem services. It combines a range of smaller projects aimed at optimizing the economic return on investments in woodland (to a lesser extend grassland and heathland) without diminishing the whole of the natural capital. Reports on wood and biomass production can be found on http://www.inverde.be/kennis-houtige-biomassa	About 300.000/year
Marine/Fisheries/Aquaculture			
Waste as Biomass source			

Food/feed use of biomass (food/feed value chains)	Flanders' FOOD	http://www.flandersfood.com/about-flanders-food	
Energy use of biomass (bioenergy)	GBEV, SET-plan		
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	FISCH Bio Base Europe	Chemistry for Sustainability: FISCH identifies, stimulates and catalyzes innovations for sustainable chemistry in Flanders by supporting companies with the initiation and set up of innovation projects. How? By supporting project set up, promoting cooperation between companies, governments and research institutions, encouraging partnerships, knowledge clustering, etc. http://www.fi-sch.be/en/ The activity domains/innovation themes are closely related to the bioeconomy: Alternatives for fossils: • Production of new Bio-mass • Bio-mass conversion • Valorization of side streams Process intensification: • Separation technology • Green solvents • Micro process technology • Catalysis, alternative energy Sustainable chemical products • Multifactoral improvement • Sustainable chemical products	
Key Enabling Technology (Industrial Biotechnology)	I-Cleantech CINBIOS	I-Cleantech Vlaanderen vzw is a network organisation in Flanders, the Northern part of Belgium. Together with companies, research institutions, public bodies and civil society actors, i-Cleantech Flanders is a catalyst for innovation in a multitude of clean technologies and assists their subsequent implementation in society at large. More specifically, i-Cleantech Flanders' mis-	

		sion is “to identify and encourage the development of cleantech instruments that accelerate the realisation of a sustainable world”. i-Cleantech Flanders works cross-sectorally between existing organisations and focuses on four cleantech domains, being energy, water, materials and mobility. Central in i-Cleantech Flanders’ structure are the pillars transition (management), research and industry. i-Cleantech Flanders stimulates cleantech in Flanders though the following actions: • A yearly Cleantech report provides a state-of-the-art overview of the development of the Flemish cleantech cluster; • Cleantech projects and networking events stimulate cooperation between companies and other stakeholders; • The “MIP” Research and Innovation programme (E: Platform for Innovation *in* Environment and Energy) provides an earmarked budget for companies and research institutes for innovative cleantech projects that are integrated into a broader system perspective; • Transition management arenas are set up in order to stimulate the transition to, respectively, sustainable water policies, sustainable energy policies and climate neutral and resilient cities; • Communications tools provide more visibility to the Flemish cleantech cluster. • So-called cleantech antennas in the Flemish provincies, one of which (East-Flanders) covers the bio-economy	
Communication, stakeholder			

involvement			
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

FISCH: http://www.fi-sch.be/en/

VISIONS: http://www.bbeu.org/visions

ARBOR: http://arbornwe.eu/ (Interreg IVB NWE)

OPTIMISC : https://optimisc.uni-hohenheim.de/

DRIVE4EU: http://www.drive4eu.eu/

Genesys: http://www.ilvogenesys.be/

GROW2build : http://grow2build.eu/

Biobase Europe INTERREG projects: http://www.bbeu.org/; recently selected as mKPL demonstrator by the EC

Interreg project "Grenzeloze logistiek" : http://www.grenzelozelogistiek.be/projecten-met-impact/verduurzamen-bio-reststromen/logistieke-optimalisatie-van-bioreststromen

FP7 project NOSHAN: http://www.noshan.eu/
COST action TD1203 – EUBIS - http://costeubis.org/
COST action FA1403 – POSITIVe - http://www.cost.eu/domains_actions/fa/Actions/FA1403
LCA studies of primary plant production systems dedictated to the bio-economy

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions	4	http://www.biomasspolicies.eu/ (VITO as Flemish project partner) http://www.biograce.net/biograce2/ (VEA as Flemish project partner)	
Resource efficiency	4	Cooperation between Flanders' Nutrientplatform, Dutch nutrient platform and German phosphorusplatform	
Renewable resources/ bio-based products	4	Flanders-Netherlands-North-rhine Westphalia (BIG-C)	
Knowledge transfer and good practice and innovation	4	Cooperation with the Netherlands ERA-IB Service point of the EIP on agricultural productivity and sustainability	
Economic/ market framework	4	Cooperation with the Netherlands	
Policy framework	4	Cooperation with the Netherlands	
Healthy food research	4	JPI HDHL	
Bioenergy	4	SET-plan	
Animal feed	4		
Development of an agreed methodology for environmental footprints	4		
Biorefineries	4	Biobase Europe pilot plant	

Food security	4	JPI FACCE	
Social inclusion	4	Programme on social innovation	
Algae	4	Algae platform	
Genetics	4	ERA-IB	
Other areas, please specify	4	ERA-SUSFOOD	

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

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Strategic Working Group on Biomass

BE - BELGIUM: WALLONIA

Joint Survey on National Bioeconomy Strategies

Country:	**Belgium**
Year of data collection:	2014
Contact mail person in charge of data collection:	MIKE TEMMERMAN

This survey consist of two parts. It is aimed to collect data on:

(5) National Bioeconomy Policies and

(6) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

Please describe where your country's definition is different from the EU definition of the bioeconomy.[21]

☒

Although topics covered by bioeconomy are supported by different incentives in the Walloon region, the concept of is not supported as such. This is the term green economy that is most often used. The term "bioeconomy" is not defined officially by the Walloon administration and it is more than likely the EU definition that will be used.

[21] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	3	
Food security/ land-use competition	5	
Healthy diet	4	
Independence from fossil resources/security of supply	4	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	4	
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	3	
Maintaining business base and employment	3	
New business, increased employment	3	
Mitigation of climate change/adaptation to climate change	4	
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	4	
Resource efficient economy (reduction of waste, use of residues)	4	
Societal demand	3	
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	No	Name of the strategy: But the green economy is involved in the greenwin competence cluster The clusters are a major tool for economic development of Wallonia through public-private partnerships between businesses, universities, research centers, training centers and public authorities. They are designed to support innovation, promote the development of collaborative research and development (R & D) investment or training, with the objective of business growth and job creation in growth markets . GreenWin speeding up innovation in environmental technologies, the cluster is dedicated to the green economy and sustainable development. It promotes the development of projects and technological partnerships around three strategic axes that are green chemistry, sustainable construction and environmental technologies. Bio-based chemicals, storage and energy management, eco-neighborhoods, management and remediation of water and soil, waste recycling are all carriers for the thematic cluster. Link: http://www.greenwin.be/
Ministry(ies) in charge of the Bioeconomy strategy ?	No	Name of the responsible Ministry/ Ministries: Regarding Bioeconomy, responsabilities between ministeries are not yet defined between DGO3 (Direction générale opérationnelle de l'Agriculture, des Ressources naturelles et de l'Environnement), DGO4 (Direction générale opérationnelle de l'Aménagement du territoire, du Logement, du Patrimoine et de l'Énergie) & DGO6 (Direction générale opérationnelle de l'Économie, de l'Emploi et de la Recherche) Link: http://www.wallonie.be/fr/guide/guide-services/1133
Does your country have a Bioeconomy advisory body/panel ?	No	Name of the body: Link:
Does your country have a Bioeconomy agency or agencies ?	No	Name of the agency:

		Link:
Does your country have a Bioeconomy observatory collecting data/info ?	No	Name of the body: Link:
Does your country have a Bioeconomy National Contact point ?	No	Name: Contact:

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[22]
Agriculture	No		
Forestry	No		
Marine/Fisheries/Aquaculture	No		
Waste	No		
Agri-Food & Food security	No		
Food, Healthy diet	No		
Research & Innovation	Yes	Through the cluster Greenwin	http://www.greenwin.be/
Green Growth Strategy	No		
Blue Growth Strategy	No		
Energy, including Bioenergy	No		
Industry, Enterprise	No		
Environment (incl. resource efficiency, sustainability, water use)	No		
Eco-System Services	No		
Regional development and Smart Specialisation	No		
Education/Skills	Yes	Training “Valebio”	http://formcont.ulb.ac.be/formation/viewSelected/367
Other areas, please specify			

[22] Please provide English link (if available)

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[23]	**Link**[24]
Walloon Region	1; Forest: over 500 000 ha	
Walloon Region	2; Agriculture: cereals production 6 331 967 t/a & industrial crops (sugar beet, patatoies, rapeseed…)	http://agriculture.wallonie.be/apps/spip_wolwin/IMG/pdf/De_waalse_landbouw_in_cijfers_2011.pdf
Walloon Region	3. Wood pellets importation for electricity production (80MWel power plant) Domestic wood pellets growing market Forest and sawmill residues use Wood waste use Biodiesel production from cereals (500 000m³ from 2 production plants: BioWanze & Biochim)	
Walloon Region	4 One paper mil is located in South Wallonia & 2 biodiesel production plants	

[23] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[24] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture			
Forestry			
Marine/Fisheries/Aquaculture			
Waste as Biomass source			
Food/feed use of biomass (food/feed value chains)			
Energy use of biomass (bioenergy)			
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	Polychanvre http://www.polychanvre.eu/	Hemp-polymer composites based on hemp granules produced in Wallonia	Interreg: 50% Regions: 50%
Key Enabling Technology (Industrial Biotechnology)			
Communication, stakeholder involvement			
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country
BioWanze (300 000 m³ biodiesel)
BioChim (200 000 m³ biodiesel)
Polychanvre

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions	5		
Resource efficiency	5		
Renewable resources/ bio-based products	5		
Knowledge transfer and good practice and innovation	5		
Economic/ market framework	5		
Policy framework	5		
Healthy food research	5		
Bioenergy	5		
Animal feed	5		
Development of an agreed methodology for environmental footprints	5		
Biorefineries	5		
Food security	5		
Social inclusion	5		
Algae	5		
Genetics	5		
Other areas, please specify			

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Strategic Working Group on Biomass

CH - SWITZERLAND

Joint Survey on National Bioeconomy Strategies

Country: Switzerland	
Year of data collection: 2014	
Contact mail person in charge of data collection: markus.loetscher@blw.admin.ch	

This survey consist of two parts. It is aimed to collect data on:

(7) National Bioeconomy Policies and

(8) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

No

Please describe where your country's definition is different from the EU definition of the bioeconomy.[25]

[25] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy		
Food security/ land-use competition	4	Constant diminution of agricultural area
Healthy diet	5	Pesticide residues, antimicrobial resistance
Independence from fossil resources/security of supply	4	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	5	
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	3	No investments in energy crops competing with food/feed production.
Maintaining business base and employment	3	
New business, increased employment	3	
Mitigation of climate change/adaptation to climate change	5	Expected increase in severe weather conditions (drought, flooding).
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	4	Part of the direct payment strategy
Resource efficient economy (reduction of waste, use of residues)	5	Reduction of food waste with innovate use of byproducts.
Societal demand		
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	Not yet. This is work in progress.	1. Name of the strategy: Agricultural Policy 2014-2017 See below 2. Name of the strategy: Aktionsplan Grüne Wirtschaft 2013 Link: http://www.bafu.admin.ch/wirtschaft/11350/12928/index.html?lang=de (only available in de, fr, it)
Ministry(ies) in charge of the Bioeconomy strategy ?	Yes	1. Name of the responsible Ministry/ Ministries: Swiss Federal Office for Agriculture FOAG http://www.blw.admin.ch/index.html?lang=en 2. Name of the responsible Ministry/ Ministries: Swiss Federal Office for Environment FOEN http://www.bafu.admin.ch/index.html?lang=en
Does your country have a Bioeconomy advisory body/panel ?	No	Name of the body: Link:
Does your country have a Bioeconomy agency or agencies ?	No	
Does your country have a Bioeconomy observatory collecting data/info ?	No	Name of the body: Link:
Does your country have a Bioeconomy National Contact point ?	No	Name: Contact:

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[26]
Agriculture	Yes	The Swiss Parliament has recently enacted the new Agricultural Policy 2014-2017 (AP 14-17). It's based on a long-term strategy of the Federal Council for agriculture and the food industry (Land- und Ernährungswirtschaft 2025). AP 14-17 should on the one hand create basic conditions that favour the optimum use of market potential by agriculture and the food industry, and on the other hand improve the effectiveness and efficiency of the direct payments system. As far as exploiting market potential is concerned, the promotion of quality and sales is of central importance and this element will be specifically expanded through AP 14-17. At the same time, the procedures for granting investment subsidies will be modified in such a way as to ensure that investments are still acceptable under the modified basic conditions and that production costs can be reduced so that the long-term competitivity of the agricultural sector can be improved. Both measures will help to raise added value in the market place. Another key element in AP 14-17 is the further development of the direct payments system, which intendeds to improve the efficiency and effectiveness of the measures, and set up a system of direct payments linked to the various objectives. The main change is the suppression of general area payments and reallocation of payments more closely related to	***Agrarpolitik 2014-2017*** (only available in de, fr, it) (https://www.wbf.admin.ch/de/themen/landwirtschaft/agrarpolitik-2014-2017) http://www.blw.admin.ch/index.html?lang=en ➔ implemented ***Land- und Ernährungswirtschaft 2025*** (http://www.blw.admin.ch/themen/00005/01170/index.html?lang=de)

[26] Please provide English link (if available)

		specific objectives (agricultural practices) complemented by a system of transition payments to make the reform socially acceptable. Also, the general headage payments to livestock will be replaced by area payments to pastures with the condition of minimal livestock husbandry (payments for ensuring food supplies). The total budgeted annual amount of direct payments remains stable on the current level of CHF 2.8 billion. The AP 14-17 has been in force since January 1, 2014.	
Forestry	Yes	forest, policy, sustainability, wood harvesting, climate change, protective forests, biodiversity, economic efficiency, forest area, soil, harmful organisms, wildlife, leisure, education, research, measures wood resource policy, wood action plan, efficient and sustainable wood supply, resource-efficient wood use, cascade use	***Waldpolitik 2020*** (only available in de, fr, it) (http://www.bafu.admin.ch/wald/01152/11490/index.html?lang=de) ➔ largely implemented ***Ressourcenpolitik Holz*** (only available in de, fr, it) (http://www.bafu.admin.ch/wald/01152/10307/index.html?lang=de) ➔ largely implemented
Marine/Fisheries/Aquaculture	No		
Waste	Yes	The measures are aimed at the following four priority areas of action: Consumption and production: Current consumption patterns and product manufacturing use large quantities of natural resources and cause major environmental impacts. For that reason, it is necessary to improve information on the ecological aspects of products and company product lines and increase innovation. Furthermore, close cooperation with the	***Aktionsplan Grüne Wirtschaft 2013*** (only available in de, fr, it) (http://www.bafu.admin.ch/wirtschaft/11350/12928/index.html?lang=de ➔ partially implemented or in preparation

		economy will provide opportunities for further efficiency improvements. Wastes and raw materials: The extraction of raw materials causes major environmental impacts. More efficient use of raw materials and the closure of material cycles need to become priorities. In the future, fewer raw materials should be used to produce goods and less waste should be generated. Cross-cutting instruments: The Cleantech Master Plan and greening the tax system are projects that deal with more than one issue.	
Agri-Food & Food security	Yes	see agriculture	
Food, Healthy diet	Yes	To promote personal responsibility To support voluntary measures by the industry To ensure food quality	***Nationales Programm Ernährung und Bewegung (NPEB)*** (only available in de, fr, it) (http://www.bag.admin.ch/themen/ernaehrung_bewegung/13227) ➔ largely implemented ***Health Equity*** (http://www.bag.admin.ch/themen/gesundheitspolitik/10417/index.html?lang=en) ➔ largely implemented ***Qualitätsstrategie der Schweizerischen Land- und Ernährungswirtschaft*** (http://www.qualitaetsstrategie.ch/) ➔ partially implemented or in preparation ***Nutrition and Physical Activity Monitoring System (MOSEB)*** (http://www.bag.admin.ch/themen/ernaehrung_bewegung/05190/index.html?lang=en) ➔ Monitoring system
Research & Innovation	Yes	Commission for Technology and Innovation (CTI)	http://www.kti.admin.ch/index.html?lang=en

		supports: Market-oriented R&D projects; Creation and development of start-up companies; Knowledge and technology transfer.	
Green Growth Strategy	Yes	Green Economy: "an economy which takes into account the scarcity of limited resources and the regeneration capacity of renewable resources, improves the resource efficiency and the performance of the economy and strengthens the welfare as a whole." The Swiss Cleantech Masterplan is work in progress for an undertaking that will continue until 2020. The federal government will observe current developments and monitor implementation of the Cleantech Masterplan. In future, further measures can be formulated and introduced on this basis.	***Aktionsplan Grüne Wirtschaft 2013*** (only available in de, fr, it) (http://www.bafu.admin.ch/wirtschaft/11350/12928/index.html?lang=de ➔ partially implemented or in preparation ***Cleantech Masterplan*** (http://www.cleantech.admin.ch/cleantech/index.html?lang=en) ➔ partially implemented or in preparation (time horizon: 2020)
Blue Growth Strategy	No		
Energy, including Bioenergy	Yes	Sparing and efficient use of energy in the agricultural and food sector	***Energy Strategy 2050*** (http://www.bfe.admin.ch/themen/00526/00527/index.html?lang=en) ➔ partially implemented or in preparation
Industry, Enterprise	Yes		
Environment (incl. resource efficiency, sustainability, water use)	Yes		***Sustainable Development Strategy*** (http://www.are.admin.ch/themen/nachhaltig/00262/00528/index.html?lang=en) ➔ largely implemented ***Adaptation to climate change in Switzerland***

			(http://www.bafu.admin.ch/publikationen/publikation/01673/index.html?lang=en) ➔ largely implemented ***Anpassung an den Klimawandel in der Schweiz. Aktionsplan 2014–2019*** (only available in de, fr, it) (http://www.bafu.admin.ch/publikationen/publikation/01762/index.html?lang=de) ➔ largely implemented ***Klimastrategie Landwirtschaft*** (only available in de, fr, it) (http://www.blw.admin.ch/themen/00010/00071/00265/index.html?lang=de) ➔ largely implemented
Eco-System Services	Yes / No		***Strategie Biodiversität Schweiz und Aktionsplan*** (only available in de, fr, it) (http://www.bafu.admin.ch/biodiversitaet/10372/10395/index.html?lang=de) ➔ largely implemented ***Agrarpolitik 2014-2017*** (only available in de, fr, it) (https://www.wbf.admin.ch/de/themen/landwirtschaft/agrarpolitik-2014-2017) ➔ implemented
Regional development and Smart Specialisation			
Education/Skills	yes		ERI policy guidelines and objectives for 2013-2016 http://www.sbfi.admin.ch/org/01645/index.html?lang=en
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[27]	**Link**[28]

[27] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[28] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	***Federal Research Station Agroscope: Thematic priorities and Research Master Plan 2014-2017*** (Link) ***Swiss National Science Foundation:*** NRP 68 Sustainable use of soil as a resource (Link)	Thematic priorities of Agroscope related with bioeconomy: ecological intensification, safeguarding natural resources, contribution of the agri-food sector to climate protection and adaptation to climate change, high-quality, safe foods for a healthy diet, improving the competitiveness of the agri-food sector Aims to fill research gaps, analyse the current condition of the soil more comprehensively and determine the key functions of soil as an ecosystem through interdisciplinary research	~€ 67 Mio./y ~€ 2.2 Mio./y (in total CHF 13 Mio./5y = ~€ 11 Mio./5y)
Forestry	***Swiss National Science Foundation: NRP 66 Resource Wood*** (Link)	Establishes basic scientific knowledge and practical methods for increasing the availability of wood as a resource and expanding its use. Develops innovative technologies and services for the material, energetic and chemical use of wood with a view to establishing a sustainable material life-cycle management.	~€ 3 Mio./y (in total CHF 18 Mio./5y = ~€ 14.8 Mio./5y)
Marine/Fisheries/Aquaculture			
Waste as Biomass source			
Food/feed use of biomass (food/feed value chains)	***Swiss National Science Foundation: NRP 69 Healthy Nutrition and Sustainable***	Generates praxis-oriented basic knowledge on how to promote healthy nutrition in Switzerland and how safe, high-quality food can be made available in sufficient	~€ 2.15 Mio./y (in total CHF 13 Mio./5y = ~€ 10.7 Mio./5y)

	Food Production (Link)	quantity and at affordable prices while minimising the negative impact on the environment and using resources as efficiently as possible.	
Energy use of biomass (bioenergy)	*See above* ***Swiss National Science Foundation: NRP 66 Resource Wood***		
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	*See above* ***Swiss National Science Foundation: NRP 66 Resource Wood***		
Key Enabling Technology (Industrial Biotechnology)	***Swiss National Science Foundation:*** **NCCR Chemical Biology** (Link)	"Chemical Biology - Visualisation and Control of Biological Processes Using Chemistry" uses chemistry tools to obtain a better understanding of life at the molecular level.	~€ 6 Mio./y
Communication, stakeholder involvement			
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational co-operations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification** [1)]
Common sustainability criteria/ GHG emmissions	5		
Resource efficiency	5		
Renewable resources/ bio-based products	3		
Knowledge transfer and good practice and innovation	4		
Economic/ market framework	4		
Policy framework			
Healthy food research	5	Joint initiatives between Swiss National Research Programme NRP 69 and the European Joint Programming Initiatives (JPI) A Healthy Diet for a Healthy Life	http://www.nfp69.ch/E/portrait/organisation/Pages/default.aspx
Bioenergy	3		
Animal feed	4		
Development of an agreed methodology for environmental footprints	4		
Biorefineries	4		
Food security	5	Joint Programming Initiatives between Swiss National Research	http://www.nfp68.ch/E/Pages/joint-programming-initiatives.aspx

		Programme NRP 68 and JPI FAC-CE	
Social inclusion	3		
Algae	2		
Genetics	5		
Other areas, please specify			

1) See participation in ERA-NETs http://www.sbfi.admin.ch/themen/01370/01683/01685/01727/index.html?lang=en

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Strategic Working Group on Biomass

CZ - CZECH REPUBLIC

Joint Survey on National Bioeconomy Strategies

Country:	**Czech Republic**
Year of data collection:	2014
Contact mail person in charge of data collection:	ladislav.jerabek@mze.cz

This survey consist of two parts. It is aimed to collect data on:

(9) National Bioeconomy Policies and

(10) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

no

Please describe where your country's definition is different from the EU definition of the bioeconomy.[29]

[29] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	3	
Food security/ land-use competition	5	
Healthy diet	4	
Independence from fossil resources/security of supply	4	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	4	
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	3	
Maintaining business base and employment	3	
New business, increased employment	3	
Mitigation of climate change/adaptation to climate change	4	
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	4	
Resource efficient economy (reduction of waste, use of residues)	4	
Societal demand	3	
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	~~Yes~~ / No	Name of the strategy: Link:
Ministry(ies) in charge of the Bioeconomy strategy ?	~~Yes~~ / No	Name of the responsible Ministry/ Ministries: Link:
Does your country have a Bioeconomy advisory body/panel ?	~~Yes~~ / No	Name of the body: Link:
Does your country have a Bioeconomy agency or agencies ?	~~Yes~~ / No	Name of the agency: Link:
Does your country have a Bioeconomy observatory collecting data/info ?	~~Yes~~ / No	Name of the body: Link:
Does your country have a Bioeconomy National Contact point ?	Yes / ~~No~~	Name: L. Jerabek – only for agricultural agenda (forestry incl.) Contact: ladislav.jerabek@mze.cz

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for down-load[30]
Agriculture	Yes / No	by national Rural Development Programme	
Forestry	Yes / No	dtto	
Marine/Fisheries/Aquaculture	Yes / No	dtto	
Waste	Yes / No		
Agri-Food & Food security	Yes / No	dtto	
Food, Healthy diet	Yes / No	dtto - partially	
Research & Innovation	Yes / No	dtto - partially	
Green Growth Strategy	Yes / No	dtto - partially	
Blue Growth Strategy	Yes / No		
Energy, including Bioenergy	Yes / No	dtto - partially	
Industry, Enterprise	Yes / No		
Environment (incl. resource efficiency, sustainability, water use)	Yes / No	dtto - partially	
Eco-System Services	Yes / No		
Regional development and Smart Spe-cialisation	Yes / No	dtto - partially	
Education/Skills	Yes / No	dtto - partially	
Other areas, please specify			

[30] Please provide English link (if available)

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[31]	**Link**[32]

[31] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[32] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	Complex sustainable systems	1 complex programme	cannot be more specified
Forestry	Complex sustainable systems	with several subprogrammes	
Marine/Fisheries/Aquaculture	Complex sustainable systems	of course only part related Bioeconomy	
Waste as Biomass source	Complex sustainable systems		
Food/feed use of biomass (food/feed value chains)	Complex sustainable systems		
Energy use of biomass (bioenergy)	Complex sustainable systems		
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**			
Key Enabling Technology (Industrial Biotechnology)			
Communication, stakeholder involvement	Complex sustainable systems	In preparation this programme and following meetings	
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

not known at this moment

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions	4		
Resource efficiency			
Renewable resources/ bio-based products	3		
Knowledge transfer and good practice and innovation	4		
Economic/ market framework			
Policy framework			
Healthy food research	4		
Bioenergy	3		
Animal feed	4		
Development of an agreed methodology for environmental footprints			
Biorefineries	3		
Food security	5		
Social inclusion			
Algae			
Genetics	4		
Other areas, please specify			

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

SCAR
Standing Committee on Agricultural Research

Strategic Working Group on Biomass

DE - GERMANY

Joint Survey on National Bioeconomy Strategies

Country:	**Germany**
Year of data collection:	reporting date: July 2014
Contact mail person in charge of data collection:	Henkvan.Liempt@bmbf.bund.de

This survey consist of two parts. It is aimed to collect data on:

(11) National Bioeconomy Policies and

(12) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

German Bioeconomy Definition (National Policy Strategy Bioeconomy):
"Knowledge-based production and utilisation of renewable resources in order to provide products, processes and services in all economic sectors within the framework of a sustainable economic system. The bioeconomy concept encompasses all economic sectors and their associated services, that produce, manage and otherwise exploit renewable resources – such as plants, animals and microorganisms and their products – produce, process, use or trade."

"The "knowledge-based bioeconomy" (…) takes natural materials cycles as its point of orientation; it bases itself upon a structural transition from an economy based on finite resources of fossil origin – mainly petroleum – to an economy more strongly based on renewable resources. New knowledge gained in the life sciences and technical sciences is bringing about a deeper understanding of the global biological systems (…).
The bioeconomy spans a bridge linking technology, the economy and ecological issues, by applying biological processes and resources, further developing them and thus enhancing their performance capability, as well as making their use more efficient and sustainable. The bioeconomy not only replaces raw materials sourced from fossils; it also develops wholly new products and processes.
Bioeconomy is the knowledge-based production and use of renewable resources, in order to provide products, processes and services in all areas of the economy, within the framework of an economic system that is viable for the future.
The concept of the bioeconomy encompasses all economic sectors and their associated commercial services, involved in producing, working or processing, using or trading with renewable resources – such as plants, animals and micro-organisms and products made from them. This is done with the aim of making it possible to effect a transition to running the economy in a way that is increasingly independent of petroleum. Thus the knowledge-based bioeconomy can be an essential part of a viable and sustainable economic system. Agriculture, forestry, fisheries, and aquaculture, but also the biotechnological use and conversion of biomass, in addition to biogenic waste materials and residual materials: these are the central starting points for the bioeconomy's value chains and value adding networks, which are interlinked in a multitude of ways. Downstream sectors work and process renewable resources to form a variety of products, partly also through industrial application of biotechnological and microbiological processes, particularly in the chemical industry. This also includes food producers, and the wood, paper, construction, leather, and textile industries, as well as parts of the pharmaceutical industry and the energy sector. To that extent they are as involved in the build-up of a bioeconomy as are the associated areas of retail, distribution and commercial service sectors. It is characteristic of the bioeconomy, firstly, that the value chains of its products in the various business sectors are increasingly networked, or respectively are able to be networked, and secondly that by-products and residual materials are used in a way that yields the highest possible value. Accordingly, the bioeconomy system also attaches particular significance to recycling and waste-management processes that can avoid residual materials and waste materials, or respectively direct them to a use that derives the highest possible value from them."
(http://www.bmel.de/SharedDocs/Downloads/EN/Publications/NatPolicyStrategyBioeconomy.pdf?__blob=publicationFile)

Please describe where your country's definition is different from the EU definition of the bioeconomy.[33]

The German and European Bioeconomy definitions are - to a large extent - in good agreement. Both definitions address biomedicine or red biotechnology – in contrast e.g. to the OECD and US definitions of bioeconomy - only to a limited extend and put a strong focus on a recycling economy, that prioritizes the use of renewable resources for safeguarding food supplies and aims to create synergies between the use of renewable resources for food, material- and energetic use. The German definition as well as the goals of the German National Policy Strategy on Bioeconomy are driven by the principle that only a sustainable bioeconomy may contribute to master global challenges like providing food for a growing mankind and the protection of the climate and conservation of the biodiversity.

"The concept of the bioeconomy takes natural cycles of materials as its point of orientation; it encompasses all sectors of the economy that produce, work and process, use, and trade with renewable resources, such as plants, animals, micro-organisms, and their derivatives. Materials used include not only raw materials produced in the agricultural, forestry and fisheries sectors, as well as in aquaculture or in microbial production; increasingly, biogenic waste materials and residual materials are also used. The bioeconomy is thus also resource-efficient recycling. The renewable resources are worked and processed to form a variety of products, also increasingly by means of industrial application of biotechnological and microbiological processes. Aside from its use for the production of materials, the use of sustainably produced biomass also acts as a significant renewable source of energy – with preference given to using it at the end of the cascading process of use."

[33] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy		The EU Strategy on Bioeconomy (2012) is making an important and valuable contribution to the continued implementation of the National Research Strategy Bioeconomy 2030 and optimally complements the German National Policy Strategy Bioeconomy adopted in 2013 by the German federal government. In the past the EU strategy on Bioeconomy was not a main driver for Germany to engage in the development of the Bioeconomy, since the German federal government started the implementation of a biobased economy already in 2009/2010, by establishing a National BioEconomy Research Strategy and a National Bioeconomy Council, respectively.
Food security/ land-use competition	5	"Securing global nutrition" and "Prevention or Mitigation of land-use competition" are major goals/ fields of action in the German Bioeconomy strategies. To ensure nutrition for 9.5 billion people in 2050 – with changed consumer demands – food production must be increased significantly and the availability of foodstuffs improved for vulnerable population groups. The arable land needed for production is limited, and in many areas is above all qualitatively and quantitatively affected by soil degradation. In the long term, agriculture will also be affected to a significant extent by the effects of climate change, and will have to cope with soil deterioration, water shortages and floods, and the spread of plant pests, amongst others.
Healthy diet	5	"Producing healthy and safe foods" is a major goal/ field of action in the German Bioeconomy strategies. Consumers expect healthy, high-quality, safe and at the same time inexpensive foods. Demographic change, changing lifestyles and circumstances are altering dietary behaviour. A healthy diet presupposes a corresponding availability of food that meets individual requirements.
Independence from fossil resources/security of supply	5	„Using renewable resources for industry" and „Developing biomass-based energy carriers" are major goals/ fields of action in the German Bioeconomy

		strategies. Biobased products, which combine biotechnical, chemical, thermal, or mechanical methods in their manufacturing process, not only help protect nature, the environment, and the climate, but also enable greater independence from fossil raw materials. Furthermore, they make a significant contribution to the structural change from a petroleum-based to a biobased industry with related opportunities for growth and employment. Industrial biotechnology, also known as white biotechnology, is an important driving force in this transition. Energy from biomass will continue to gain in importance as a component of the overall energy mix. In the framework of regional health provision concepts, this can contribute to local creation of value, and to the creation of jobs in agriculture, forestry, and industry. Extensive technical research work and studies into sustainability as well as scientific monitoring of demonstration projects and market introductions will be essential if bioenergy is to become internationally competitive. The challenge also lies in establishing modes of production and utilization that climate-, nature-, and environment-friendly. Systems should be de-signed to be efficient, sustainable, and economical along the entire process chain.
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	5	“Ensuring sustainable agricultural production” is a major goal/ field of action in the German Bioeconomy strategies. Natural resources are the means of production for the bioeconomy, and thus their sustainable management is in the highest interest. The required increase in agricultural production must be achieved by means of efficient and resource-friendly management. the implementation of this must correspond to the challenges posed by climate change, environmental and climate protection, raw material supplies, water availability, and biodiversity protection. This also demands research efforts that take into account all the factors of agricultural production systems – for terrestrial as well as aquatic biomass production – according to specific location requirements, and allowing for aspects of sustainability.
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	5	See above
Maintaining business base and employment	5	Strengthening the innovation power and the national and international competitiveness of Germany as a place for reseach-, investment and innovation

		as well as creating sustainable added value, are important goals/fields of action in the German Bioeconomy strategies. Training and education are - besides the safeguarding of employment and job creation – also important topics for a successful implementation of a biobased economy.
New business, increased employment	5	“Growth markets, innovative technologies and products” are further major goals/ fields of action in the German Bioeconomy strategies, and provide the basis for new business models and can speed up structural change towards international competitiveness, to the development of new markets meeting among others new societal needs.
Mitigation of climate change/adaptation to climate change	5	Mitigation of climate change/adaptation to climate change and sustainable climate protection are major cross-sectional responsibilities addressed in the German Bioeconomy policies.
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	5	Environmental protection/ environmental sustainability, by maintaining biodiversity and soil fertility among others, are major cross-sectional responsibilities addressed in the German Bioeconomy policies.
Resource efficient economy (reduction of waste, use of residues)	5	Resource efficient economy, with an emphasis on Biorefineries using all components of various plants and/or waste, as well as residual materials, is an important driver of the German bioeconomy.
Societal demand	5	The German bioeconomy strategies place considerable importance on the need to meet societal demands and on maintaining a dialog with the general public and Bioeconomy has to take account of the growing societal demands concerning the question how products are manufactured. This applies to the compliance of environment, health and animal welfare standards as well as the adherence to social standards. Sustainable consumption is an important part of the bioeconomy value chain - Consumers will decisively influence the development of a bioeconomy. Information and transparency empower the consumers to make purchasing decisions on the basis of sustainability concerns.
Other drivers – please specify		

I POLICY Q 3A: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy?	Yes	Policy Strategy Bioeconomy http://www.bmel.de/SharedDocs/Downloads/EN/Publications/NatPolicyStrategyBioeconomy.pdf?__blob=publicationFile National BioEconomy Research Strategy 2030 www.bmbf.de/pub/bioeconomy_2030.pdf Biorefineries Roadmap http://mediathek.fnr.de/broschuren/fremdsprachige-publikationen/english-books/biorefineries-roadmap.html and www.bmbf.de/pub/roadmap_biorefineries.pdf
Ministry(ies) in charge of the Bioeconomy strategy?	Yes	Name of the responsible Ministry/ Ministries: Policy Strategy Bioeconomy – under the aegis of Federal Ministry for Food and Agriculture (BMEL). Other involved ministries: Federal Ministry for Education and Research (BMBF), Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), Federal Ministry of Transport and digital Infrastructure (BMVI), Federal Ministry of Economics and Energy (BMWi), Federal Ministry for Economic Cooperation and Development (BMZ) www.bmel.de National BioEconomy Research Strategy 2030 – under the aegis of Federal Ministry for Education and Research. Other involved ministries: Federal Ministry for Food and Agriculture (BMEL), Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB), Federal Ministry of Economics and Energy (BMWi), Federal Ministry for Economic Cooperation and Development (BMZ) http://www.bmbf.de/de/biooekonomie.php Biorefineries Roadmap – under the aegis of Federal Ministry for Education and Research and Federal Ministry for Food and Agriculture. Other involved ministries: Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and the), Federal Ministry of Economics and Energy (BMWi) http://mediathek.fnr.de/broschuren/fremdsprachige-publikationen/english-books/biorefineries-roadmap.html or www.bmbf.de/pub/roadmap_biorefineries.pdf
Does your country have a	Yes	Name of the body:

Bioeconomy advisory body/panel?		Bioeconomy Council http://biooekonomierat.de
Does your country have a Bioeconomy agency or agencies?	Yes	Name of the agency: Projektträger Jülich, PtJ – Project Management Jülich www.ptj.de Fachagentur Nachwachsende Rohstoffe e.V., FNR – Agency for Renewable Resources www.fnr.de Bundesanstalt für Landwirtschaft und Ernährung, BLE – Federal Office for Agriculture and Food www.ble.de
Does your country have a Bioeconomy observatory collecting data/info?	Under development	The Interdepartmental Working Group Bioeconomy of the Federal Government has set the objective to implement a bioeconomy monitoring project under the aegis of Federal Ministry for Education and Research
Does your country have a Bioeconomy National Contact point?	Yes	National Contact Point Life Sciences www.nks-lebenswissenschaften.de National Contact Point Life Sciences PtJ and PT-DLR Joseph-Schumpeter-Allee 1 D-53227 Bonn Tel.: +49 (0)228-3821-1697 Fax: +49 (0)228-3821-1699 Email: nks-lebenswissenschaften@dlr.de

Bioeconomy related policies Q 3B:	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[34]
		Comment: *The most important strategies listed in the "Policy Strategy Bioeconomy" are specified below.* *In 2014 some of the strategies are phasing out, follow up strategies are in preparation*	
Agriculture	Yes / No		
Forestry	Yes	"Forest Strategy 2020" (2011): Forests and forestry are more closely linked to climate than any other sector. Whilst the preservation of forests, sustainable forest management and timber use can have a positive effect on climate, climate changes can have a negative impact on the health of our forests. The release of CO2 can be avoided or reduced as a consequence of carbon storage in forests, the replacement of fossil fuels and the sequestration of carbon in long-livid timber products.	*www.bmel.de/.../EN/.../ForestStrategy2020.pdf*
Marine/Fisheries/Aquaculture	Yes / No		
Waste	Yes	"Biorefineries Roadmap" (2012): The 'Biorefineries Roadmap' makes a contribution to the German federal government strategy for the development of a bioeconomy	*www.bmbf.de/pub/roadmap_biorefineries.pdf*

[34] Please provide English link (if available)

		specified in the 'National Research Strategy Bioeconomy 2030', the "Policy Strategy Bioeconomy", the federal government's energy concept and 'National Climate Initiative', and in the action plans for the material and energetic utilization of renewable resources. Biorefinery concepts – as central elements of a bio-based economy, and promising largely waste-free use of biomass, efficient conversion routes, and pathways for the energetic and material use of biomass – could play an important role for a future bioeconomy in the utilization and conversion of biogenic raw materials and residues.	
Agri-Food & Food security	Yes / No		
Food, Healthy diet	Yes / No		
Research & Innovation	Yes	"National Research Strategy Bioeconomy 2030 – our route towards a biobased economy", adopted in 2010, provides the foundation for innovations in the bioeconomy by means of research and development. Bioeconomy is an element of the "High-Tech Strategy 2020 for Germany. Ideas. Innovation. Growth" and of the Forward-looking project "Renewable raw materials as an alternative to oil", it provides important impetus in the energy and climate areas of action (among others).	www.bmbf.de/pub/bioeconomy_2030.pdf www.bmbf.de/pub/hts_2020_en.pdf .
Green Growth Strategy	Yes / No		
Blue Growth Strategy	Yes / No		
Energy, including Bioenergy	Yes	"Energy Concept for an Environmentally Sound, Reliable and Affordable Energy Supply" (2010); "Action Plans for the use of renewable raw materials as materials and as	http://www.bundesregierung.de/Content/DE/StatischeSeiten/Breg/Energiekonzept/dokumente.html http://www.bmwi.de/EN/Service/publications,did=367764.html?view=renderPrint

		energy sources" (2009/2010); "National Action Plan for Renewable Energies" (2010), Federal Government's Mobility and Fuel Strategy" (2013): Renewable energies are acquiring a growing role as an increasingly important pillar of energy supply and as a driver of innovation and modernization in the energy infrastructure. With renewable energies accounting for a constantly growing share, the energy supply system as a whole nevertheless requires optimization. The aim of the strategies is to transform energy supply in a way that makes economic sense for industry and consumers. In this context one of the great challenges lies in the sustainable use and generation of bioenergy,	
Industry, Enterprise	Yes / No		
Environment (incl. resource efficiency, sustainability, water use)	Yes	Efforts to improve resource efficiency are being made in many of the German government's policy areas: e.g. "National Sustainable Development Strategy " "German Resource Efficiency Programme" (2012):	http://www.bundesregierung.de/Webs/Breg/EN/Homepage/_node.html www.bundesregierung.de/.../2012-06-07-fortschrittsbericht-2012-englisch-... www.bmub.bund.de/fileadmin/bmu-import/files/.../progress_en_bf.pdf
Eco-System Services	Yes / No	"National Strategy on Biological Diversity" (2007)	www.bmub.bund.de/.../broschuere_biolog_vielfalt_strategie_en_bf.pdf
Regional development and Smart Specialisation	Yes / No		
Education/Skills	Yes / No		
Other areas, please specify			

Q 3C: Please list Bioeconomy regions and/or clusters in your country (if available)

Name	Description of the focus/specialisation[35]	Link[36]
Bioenergieregionen - Bio-energy regions	Focus is mostly the transition from fossil energy supply to bioenergy and renewable energies.	http://www.bioenergie-regionen.de/
CLIB2021 (cluster)	CLIB2021 is a cluster with more than 70 members, mainly from industry and small and medium-sized companies. Among the members are also large concerns, academic facilities, investors and infrastructure organisations. CLIB2021 initiates and accompanies R&D in the areas of renewable raw materials, monomers and polymers, fine chemicals, pharmaceuticals, body care and cosmetics; where necessary, we arrange for public funding from the Ministry of Education and Research, the Ministry of Food, Agriculture and Consumer Protection, and the EU. Since 2008, CLIB2021 has initiated R&D projects to a total volume of around 50 million euros.	www.clib2021.de/en
Bioeconomy Cluster Central Germany	The focus of the leading edge cluster is on biomass that is not needed for the food and feed industries. In practice this means cleverly cascading utilisation and re-connecting strong industries in the region (Central Germany) like forestry, timber processing, the chemical and plastics industries, and bioenergy. The cluster's strategy is to develop the region's economy in the context of a bioeconomy and to create new impulses for growth. Its aim is to balance the material and energetic use of biomass. This can be achieved using the scarce resource of biomass in the most intelligent and mutually beneficial way. Partners from industry and research are working on the foundations	http://en.bioeconomy.de/

[35] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[36] Please provide English link (if available)

	of the material and energetic use of non-food biomass. Relevant sectors, like the timber and forestry industry, the chemical industry, the plastics industry and plant engineering, are all working together as part of a regional centre of competency in bioeconomics. An integrated approach to up-scaling enables processes to be developed quickly from laboratory to industrial scale	
Fraunhofer Center for Chemical-Biotechnological Processes CBP Leuna	In view of the finite nature of fossil resources, the growing demand for resources and climate change, the use of renewable raw materials has acquired great significance. The Fraunhofer Center for Chemical-Biotechnological Processes CBP in Leuna closes the gap between pilot plant and industrial implementation. By making infrastructure and plants / miniplants available, the Fraunhofer CBP makes it possible for cooperation partners from research and industry to develop and scale processes for utilizing renewable raw materials up to an industrial scale. Thus the Fraunhofer CBP represents a hitherto unique platform for the development of new processes up to and including product relevant dimensions, with a direct link to the chemical industry on the one hand and to Fraunhofer research on the other.	http://www.cbp.fraunhofer.de/en.html
Cluster Biokatalyse 2021	The BIOCATALYSIS2021 Cluster, with more than 70 partners throughout Germany, links the unique expert knowledge of large concerns, small and medium-sized companies, academic research groups and agencies for innovation or economic development. Networking of the partners ensures that basic science is translated by the chemical, cosmetics, food, pharmaceutical and detergent industries into innovative products covering the entire value chain from screening to end user. The primary goals of BIOCATALYSIS2021 are: • Development of new biocatalysts able to achieve novel syntheses under unusual operating conditions (such as extreme temperature, pressure, pH, salinity and solvent ranges). • Innovative screening technologies, more efficient production and processing technologies	www.biocatalysis2021.net

	• Initiation of national and international cooperations • Promotion of young scientists and business start-ups	
BioPro Baden Württemberg	The Cluster Biopolymers/Biomaterials supports R&D projects which, as a result of process optimization along the entire value chain, develop innovative biomaterials at competitive prices and make them accessible for a wide market. In this context, traditional chemical processes are being increasingly optimized or replaced by the use of biotechnological methods. The development of organically based plastics in joint projects integrating research facilities and end users makes it possible to match the requirements of the target markets at an early date, thus facilitating the launching of new products in the market. The main focus here is on the technical plastics such as polyesters and polyamides. If the separate elements of these classes of products can be successfully produced at high yield levels and in high purity by fermentation, the foundation will be laid for the production of high-tech plastics on the basis of renewable raw materials.	**http://www.bio-pro.de/biopolymere/**
IBB Netzwerk GmbH	The BioM WB network - since October 1, 2012 IBB Netzwerk GmbH - for promoting White Biotechnology in Bavaria is devoted to technology transfer. It is characterized by its highly dynamic innovation alliances between industrial concerns, small and medium-sized companies and academia engaged in interdisciplinary, cross-sectoral and international activities. BioM WB catalyzes the formation of project consortia, supports and accelerates the identification of suitable financial sources, provides background information and represents the interests of the network partners in their dialogue with politics. IBB Netzwerk GmbH... • conducts technology scouting und market monitoring • identifies suitable project partners • connects companies and academia across sectors • organizes meetings for members of the network • initiates and accompanies research and development pro-	**www.ibbnetzwerk-gmbh.com/**

	jects • builds the interface to appropriate financial sources and granting agencies • performs administrative project management • promotes and accompanies spin-offs and start-ups as well as the settlement of companies • initiates commercial transactions and deals • fills slots of conferences and meetings with network members • presents the concept and the achievements of the network in congresses and trade fairs • provides the network and public with prepared relevant information • arranges events for professionals and general public • abets the dialogue with politicians by organizing parliamentary evenings, workshops and plant visits	
Straubing Sand BioCampus Cluster	1,3,4 (8e regio) The BioCampus Straubing GmbH manages a cluster for renewable raw materials (energy and material usage). The Cluster can be seen as a Bavarian technology platform for usage, technology and knowledge transfer in the context of renewable raw materials.	http://www.straubing-sand.de/biocampus/
BioEconomy Science Center (BioSC)	The Bioeconomy Science Center (BioSC) is a scientific center of competence that will conduct research for a sustainable bioeconomy using an integrative overall concept. The BioSC is founded by RWTH Aachen University, the universities of Bonn and Düsseldorf, and the Forschungszentrum Jülich based on a joint strategy involving numerous pre-existing scientific networks and collaborations. The BioSC integrates all relevant scientific disciplines for a sustainable supply of biomass and bio-based products and processes within the value network bioeconomy	http://www.biosc.de/index.php?index=53

	The Bioeconomy Science Center mainly focuses on four Research Areas: • Sustainable plant production and resource stewardship, • Microbial and molecular transformation, • Chemical engineering and processing of renewable re-sources, and • Economic and social implications. These research topics are connected and supported by cross-cutting topics: • Systems Engineering, • Bioinformatics and knowledge management and • Structural biology	
ScienceCampus Halle - Plant-Based Bioeconomy	1-4 (10e regio) The ScienceCampus Halle - plant-based bioeconomy (WCH) unites leading experts in the field of plant science, agricultural, economic and social sciences in order to meet these social challenges of our time. Synergies shall be created between the members of the SCH enabling the combination of strengths in teaching and research in order to initiate new joint projects. Expertise and existing structures at the university shall be linked to strategic priorities in research and teaching at the four Leibniz-Institutions in the region of Halle.	http://www.sciencecampus-halle.de/index.php/homepage.html
Competence Networks in Agricultural and Nutrition Research	With the Competence networks in Agricultural and Nutrition research an excellent and internationally competitive agricultural research has been implemented that accelerates the transition from research results to practical applications and addresses,	http://www.bmbf.de/de/11963.php

additionally, the education of young scientists.

The competence networks reflect the entire agricultural value chain, from initial production of natural resources to the provision of high-quality raw materials such as biomass, animal feed and food for consumers:

CROP.SENSe.net - Sensor technology for crop research, breeding and management: Non-destructive sensor methods and high throughput technologies are being used and optimized in the lab and field to objectively record plant and soil characteristics over time and space in different environments.

WeGa – Competence Network for horticultural research: Interdisciplinary horticultural research (economics, plant biotechnology, phytopathology, bioinformatics, technology R&D) to improve safety of horticultural production processes and products.

Synbreed - Synergistic Plant and Animal Breeding: Utilization of advanced technologies such as next-generation-sequencing and high-throughput genotyping for functional analysis of native biodiversity, genetic analysis of complex traits as well as the development and implementation of optimal breeding strategies.

FoCus - Food Chain Plus - Identification and utilisation of health promoting ingredients in milk and dairy products.

PHÄNOMICS - a system biological approach of genotype-phenotype-distinction in the context of farm animal performance, health and welfare in cattle and pig: Farm Animals provide an essential resource for the long-term production of high value food, which is tailored to suit the market needs. The growing population worldwide, the increasing prosperity in the newly industrialising

	countries and the change of food pattern will further increase the demand for products of animal origin. Up to now the performance of animal could be raised explicitly by directed breeding, though at the expense of health and welfare. The future production of food of animal origin will stringently require the animal health as the leading concept, in which animal health and welfare demonstrate the link between the necessary connection of animal protection and sanitary consumer protection	
Industrial Biotechnology Innovation Initiative	The Industrial Biotechnology Innovation Initiative aims to speed up the adoption of established biotechnological processes in the industry. • "Zero Carbon Footprint": Biotechnological utilization of high-carbon waste-flows like sewage or flue gas from coal-fired power stations • "FuPol" - Production of concrete plasticizers on base of renewable raw materials, novel functionalization of polymer fibres, development of cleaning enzymes for polymer fibres • "NatLifE" - Ingredients for food and cosmetics from natural sources • "TeFuProt" - Provision of plant proteins resp. modified proteins with techno-functional properties	http://www.bmbf.de/de/16336.php
Biotechnology 2020+ initiative	Structural projects within the frame of the Biotechnology 2020+ initiative (BMBF together with Max Planck Society, Helmholtz association, Leibniz Research Community and Fraunhofer Society) • Max Planck Society: MaxSynBio research network (synthetic biology and artificial cells)	https://www.biotechnologie2020plus.de/BIO2020/Navigation/DE/Foerderung/grossprojekte.html

	• Helmholtz Association: Molecular Interaction Engineering, (hybrid technologies) • Leibniz Association: Leibniz Research Cluster (new active substances using high-tech synthetic pathways) • Fraunhofer Society: Biomolecules from the Production Line (bioreactor for cell-free protein synthesis)	
Activities - Federal States of Germany	North Rhine-Westphalia Bioeconomy strategy (2013) BIO NRW: BIO.NRW fosters cooperation between researchers, developers, investors and politicians on the state, national and international level in North Rhine-Westphalia. Research programme Bioeconomy Baden-Württemberg INTERREG Va: Bioökonomie Weser-Ems 2020 Center of Applied Bioeconomy (CAB): Osnabrück University of Applied Sciences and German Institute of Food Technologies (DIL) ChemieCluster Bayern LOEWE Center for synthetic microbiology (SYNMIKRO)	http://www.bio.nrw.de/en/home http://mwk.baden-wuerttemberg.de/service/publikationen/forschung/ edr.eu/nl/download/116/rnd,288053 http://www.chemiecluster-bayern.de/en/ http://www.synmikro.com/en/

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFund-ing allocat-ed to the programme (€ / year)**
		**** The budget of the "Förderprogramm Nachwachsende Rohstoffe" encompasses all activities; no budget is ear-marked for specific activities. So the budget of 61 M € in 2014 can count only once.***	
	National Research Strategy Bioe-conomy 2030	***The budget specified for the National Research Strategy Bio-economy 2030 encompasses all funding programmes marked with the acronym NRSB2030***	***135 M € in 2014***
Agriculture			
	NRSB2030 funding programme: „Soil as a Sustainable Resource for the Bioeconomy – BonaRes" (https://www.ptj.de/biooekonomie)	BonaRes is a funding program of the Federal Ministry of Education and Research (BMBF) under the umbrella of the National Research Strategy BioEconomy 2030. Soil productivity is the key resource for a sustainable land based production of plants and, hence, the first essential step in bioeconomical value chains. In order to maintain or increase the fertility of productive soils, the knowledge of soil functions has to be further enhanced.	see above
	NRSB2030 funding programme: „GlobE – global food securi-ty"(https://www.ptj.de/biooekonomie)	Securing the global food supply is a central aim of the National Research Strategy BioEconomy 2030. The Federal Ministry of Education and Research launched the funding initiative "Securing the Global Food Supply" (GlobE) to support the global develop-ment of sustainable, high-output agriculture.	see above

NRSB2030 funding programme: “Plant Biotechnology of the Future” (https://www.ptj.de/biooekonomie)	The “Plant Biotechnology of the Future” research initiative was launched by BMBF in 2011 as the successor to the national research program GABI (Genome Analysis in the Biological System of the Plant) and involves public institutions and private enterprises (public-private partnership). Its focal areas of research are: (1) Increasing yields and yield stability in crops (2) Creating and selecting quality traits (3) Sustainable crop cultivation	see above
NRSB2030 funding programme: “Transnational PLant Alliance for Novel Technologies – towards implementing the Knowledge-Based Bio-Economy in Europe” (PLANT-KBBE) (https://www.ptj.de/biooekonomie)	Superior purpose of the PLANT-KBBE funding initiative is the implementation as well as continuation of transnational research projects between research groups and enterprises of the partner countries (F, ES, P), with the objective of further deepening the already existing cooperation between economy and science in and between these countries. In the framework of PLANT-KBBE especially small and medium enterprises (SME) are addressed and concurrently encouraged to be involved in the composition of project ideas as a leading partner. With this funding activity also research institutions and businesses from other countries are explicitly addressed, because they can be associated to existing transnational consortia of the partners mentioned above, provided that they introduce their own funds into the collaboration.	see above
NRSB2030 funding programme: "Innovative Plant Breeding within the Cultivation System (IPAS) (https://www.ptj.de/biooekonomie)	In times of a rapidly growing world population and advancing climate change, the establishment of sufficient and sustainable agricultural production is a central global task. To facilitate the paradigm shift from an oil-based to a sustainable biomass-based economy, additional biomass-based resources must be made available for industrial and energy use. Sustainable biomass production calls for strategies and forms of production which are profitable, efficient in technological terms and sustainable. Open competition between different options is necessary to achieve the best possible result. Plant breeding is one of the fields which are expected to make central contributions	see above

	to solutions. The implications of the use of plant-breeding innovations therefore must be analysed in detail and their social, economic and ecological impact must be recorded. The aim is to develop biobased products not only for laboratory use but also for application in agricultural businesses and relevant bioeconomy industry.	
NRSB2030 funding programme: "Competence Networks in Agricultural and Nutrition Research" (https://www.ptj.de/biooekonomie)	With the Competence Networks in Agricultural and Nutrition Research BMBF has implemented excellent and internationally competitive agricultural research projects with the aim to accelerate the transition from research results to practical applications and addresses. The competence networks reflect the entire agricultural value chain, from initial production of natural resources to the provision of high-quality raw materials such as biomass, animal feed and food for consumers.	see above
NRSB2030 funding programme: "German Plant Phenotyping Network (DPPN)" (https://www.ptj.de/biooekonomie)	The goal of the German Plant Phenotyping Network (DPPN) is the establishment of new concepts and technologies for phenotyping, phenotyping standards, productive and efficient infrastructure, robust portfolio of phenotyping approaches, at the partner institutions to support German and international developments in plant sciences.	see above
Programme for Decision Support (EH)	Research projects to supply the BMEL with guidelines for decision-making: Implementation of projects along the whole value added chain including food/feed , fisheries and aquaculture	~7 Mio. €/year
Model and Demonstration projects - Animal welfare	The MaD animal welfare are to achieve a rapid and effective transfer of research results into agricultural practice and thus close the gap between science and practice, including communication and stakeholder involvement	~5 Mio. €/year

Model and Demonstration projects - Plant protection	Projects for sustainable use of plant protection agents/pesticides is the consequent implementation of integrated pest management (IPM) strategies on farm level (National Action Plan), including communication and stakeholder involvement	~1 Mio. €/year
Federal scheme for organic farming and other forms of sustainable agriculture (BÖLN)*	The Federal Scheme for Organic Farming and other forms of sustainable agriculture (BÖLN) aims to improve the general conditions for organic and other forms of sustainable agriculture and the corresponding food sector in Germany as well as to establish the prerequisites for an equally weighted growth of supply and demand. The programme is financed by the Federal Ministry of Food and Agriculture (BMEL) and coordinated and implemented by the BÖLN Agency within the Federal Office for Agriculture and Food (BLE). At the end of 2001, the programme started as Federal Organic Scheme (BÖL). It was based on a weak point analysis and recommendations resulting thereof of a group of external experts and representants of the German organic farmers' associations. The experts' opinion from science, economy and administration has also been integrated into the concept of the programme. At the beginning, the measures of the Federal Scheme mainly focused on information and education in order to sensitize farmers, processors, salesmen and scientists in equal measure to organic farming. For due to the opinion of the Federal Government the development of the organic sector at that time strongly depended on the on the commitment and the decisions of the single stakeholders in the market. In between, the focus of the Federal Scheme shifted to the funding of research projects. Due to a Decision of the German Bundestag of 26. November 2010, the Federal Scheme has been extended by other forms of sustainable agriculture. Correspondingly, the Information Management area	9,875 Mio. €/year

	was complemented by measures for sustainable agriculture. Additionally, a Funding Directive has been prepared research and development projects as well as measures with respect to technology and knowledge transfer for a sustainable production, processing and marketing of agricultural products to be funded. Since 2001 more than 800 projects along the whole value chain including aquaculture, food/feed as well as communication and stakeholder involvement (applied research)	
Innovation Support Programme	The national programme focuses on technical and non-technical support of innovation and applied research in Germany in the field of nutrition, agriculture and consumer protection. The programme aims are (1) improving the competitiveness of German companies, (2) strengthening the economic power of innovation, (3) maintaining/enhancing employment, (4) protection of natural resources and (5) improving working conditions. [Basically, projects in the categories of “industrial research” and “experimental development” are funded.] Concerning the National Research Strategy of Bioeconomy these measures serve to build on current strengths in science and industry: - Securing global nutrition, - Producing healthy and safe foods - Ensuring sustainable agricultural production	~ 35 Mio. €/year
Global Food Security and International Research Cooperation*	In order to support the international policy of BMEL, particularly to	3 Mio. €/year

		improve the world's situation in the area of food security, practice-oriented research projects are intended to be carried out in cooperation between German research institutions in the agricultural and nutrition sector and relevant research institutions in selected countries. Main goals of the cooperation projects are to contribute to the development of the mentioned research in selected countries and to initiate the constitution of strategic research partnerships and international research networks. This programme also supports the implementation of a bilateral exchange of researchers and experts. In addition, also initiatives and projects with a European dimension are funded along the whole value chain, including fisheries, forestry, feed/food as well as the aspect communication and stakeholder involvement. Most used instruments are ERA-Nets and JPIs.	
Forestry	Waldklimafonds (WKS) http://www.waldklimafonds.de/	**The main aim of the Forest Climate Fonds (Waldklimafonds) is to maintain and increase the CO_2 reduction potential of forests and timber as well as the adaption of forests to climate change. The measures serve the adaption of forests to climate change and maintain the essential contributions of forests with diversity in structure and species to protect the conservation of nature permanently. Positive effects on tapping the CO_2 reduction potentials and energy potentials of forests and wood are to be strengthened. If possible - synergies between climate protection, adaption of forests to climate change and conservation of biodiversity should be used.**	13,6 Mio. €/year

Marine/Fisheries/Aquaculture	See above Programme for Decision Support (EH), Model and Demonstration projects - Animal welfare, Federal scheme for organic farming and other forms of sustainable agriculture (BÖLN)*, Innovation Support Programme		
Waste as Biomass source	NRSB2030 funding programme: "BioEnery 2021 Module A: Biorefinery of the future" (https://www.ptj.de/biooekonomie)	Research projects in this programme address the whole range of potential usage of biomass (fuel, electricity and heat), in particular the use of specific energy plants and the use of biological remainders and waste. The funding has covered three different modules – "Biorefinery of the future" (module A), "Energy crops" (module B) and "Bioenergy idea contest" (module C) – which represent different approaches in terms of raw materials and conversion with different medium- and long-term objectives. The research activities in all the modules are required to focus on a holistic reflection of the technological challenges along the value creation chain, whilst also taking into account current and future economic and ecological requirements.	see above
Food/feed use of biomass (food/feed value chains)	See above Programme for Decision Support (EH), Model and Demonstration projects - Animal welfare, Federal scheme for organic farming and other forms of sustainable agriculture (BÖLN)*, Innovation Support Programme		
Energy use of biomass (bioenergy)	NRSB2030 funding programme: "BioEnery 2021" (https://www.ptj.de/biooekonomie)	See above Research projects in this programme address the whole range of potential usage of biomass (fuel, electricity and heat), in particular the use of specific energy plants and the use of biological remainders and waste. The funding has covered three different modules	see above

		– “Biorefinery of the future” (module A), “Energy crops” (module B) and “Bioenergy idea contest” (module C) – which represent different approaches in terms of raw materials and conversion with different medium- and long-term objectives. The research activities in all the modules are required to focus on a holistic reflection of the technological challenges along the value creation chain, whilst also taking into account current and future economic and ecological requirements.	
	BioProFi - BioEnergy - Process-oriented Research and Innovation	The main aim of bioenergy research is to enable internationally competitive use of biomass in Germany. Expertise from science and industry has been and continues to be consolidated to exploit the potential harboured in new bioenergy research approaches. These include integrative approaches that couple biomass use for energy and material, and alongside energy also supply renewable raw materials for the chemicals industry. The aim of the Bioenergy Process-Oriented Research and Innovation (BioProFi) funding initiative is to use innovative projects from basic research to develop new, promising ideas on the use and recovery of biomass. A knowledge base is to be created to improve existing technologies and produce new process chains.	total 35 M € / ~ 7.5 M € in 2013
	Förderprogramm Nachwachsende Rohstoffe http://www.fnr.de/projekte-foerderung/nachwachsende-rohstoffe/foerderziele/ http://mediathek.fnr.de/media/downloadable/files/samples/b/r/brosch_foerderprogramm_nawaro_web_2012.pdf	**R&D Programme “Renewable Resources”** Funding programme for R&D&I for non-food usage of biomass (energy and material applications) upstream and downstream	61 M € * (2014)

	Energie- und Klimafonds – Energy and Climate Fund http://www.fnr.de/projekte-foerderung/energie-und-klimafonds/ Energetische Biomassenutzung – Biomass for Energy https://www.energetische-biomassenutzung.de/en/home.html	**Energy and Climate Fund:** Fachagentur Nachwachsende Rohstoffe e.V. funds projects contributing to the following goals: • Integration of bioenergy into the future energy system • Breeding of energy plants to adapt to climate change • Intteligent solutions for the combined usage of bioenergy and other renewable energies • Increasing efficiency of decentral bioenergy concepts • Development of conversion routes to produce bioenergy carriers from algae • Biofuels • Research on humus and and nutrition effects of residues from biomass conversion plants on soils **Biomass for Energy:** The subject of the funding is the research and development of energy efficient technologies and the optimisation of processes and procedures. Feasibility studies, monitoring programs, pilot and demonstration projects are supposed to contribute substantially in the light of sustainability and climate change issues to improve the energy use of biomass.	10,7 M € (2013)
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	NRSB2030 funding programme: “Genome research on microorganisms – GenoMik” (https://www.ptj.de/biooekonomie)	Microorganisms, or parts of microorganisms, will provide a platform for new products and industrial methods. Be it for chemical companies, the pharmaceutical industry or food concerns – industrial practices are likely to become much more environmentally and resource-friendly as a result of this growing branch of science. To better address this potential for new industrial applications, the German Federal Ministry of Education and Research (BMBF) launched the "GenoMik Industry" initiative.	see above

	NRSB2030 funding programme: “Industrial Biotechnology Innovation Initiative” (https://www.ptj.de/biooekonomie)	The Industrial Biotechnology Innovation Initiative of the BMBF has the goal to accelerate the adoption of established biotechnological processes in the economy and a corresponding transition to a bio-based economy. • “Zero Carbon Footprint”: Biotechnological utilization of high-carbon waste-flows like sewage or flue gas from coal-fired power stations • “FuPol” - Production of concrete plasticizers on base of renewable raw materials, novel functionalization of polymer fibres, development of cleaning enzymes for polymer fibres • “NatLifE” - Ingredients for food and cosmetics from natural sources • “TeFuProt” - Provision of plant proteins resp. modified proteins with techno-functional properties	see above
	High-tech strategy “Leading-Edge Cluster Bioeconomy” (http://www.bmbf.de/en/20860.php)	The cluster’s strategy is to develop the region’s economy in the context of a bioeconomy and to create new impulses for growth. Its aim is to balance the material and energetic use of biomass. This can be achieved using the scarce resource of biomass in the most intelligent and mutually beneficial way. The focus of the leading edge cluster is on biomass that is not needed for the food and feed industries. In practice this means cleverly cascading utilisation and re-connecting strong industries in the region like forestry, timber processing, the chemical and plastics industries, and bioenergy.	up to 40 M €/5 years
	Förderprogramm Nachwachsende Rohstoffe http://www.fnr.de/projekte-foerderung/nachwachsende-rohstoffe/foerderziele/		61 M € * (2014)

	http://mediathek.fnr.de/media/downloadable/files/samples/b/r/brosch_foerderprogramm_nawaro_web_2012.pdf		
Key Enabling Technology (Industrial Biotechnology)	Förderprogramm Nachwachsende Rohstoffe http://www.fnr.de/projekte-foerderung/nachwachsende-rohstoffe/foerderziele/ http://mediathek.fnr.de/media/downloadable/files/samples/b/r/brosch_foerderprogramm_nawaro_web_2012.pdf		61 M € * (2014)
	NRSB2030 funding programme: "Next Generation of Biotechnological Procedures – Biotechnology 2020+" (https://www.ptj.de/biooekonomie; http://www.biotechnologie.de/BIO/Navigation/EN/funding,did=164934.html?view=renderPrint)	In the Biotechnology 2020+ initiative, BMBF is working together and engaged in a dialogue with research organisations and universities on long-term planning for the developmental stages required towards the next generation of biotechnology processes. Entirely new approaches are needed to realise the full potential of biotechnological production methods; in particular, this will involve the closer interconnection of concepts from the life sciences with those from the engineering sciences. • Funding initiative: "Base technologies for the next generation of biotechnological processes. " • Funding initiative: "Research price next generation of biotechnological processes."	see above
Communication, stakeholder involvement	Förderprogramm Nachwachsende Rohstoffe http://www.fnr.de/projekte-		61 M € *

	foerderung/nachwachsende-rohstoffe/foerderziele/ http://mediathek.fnr.de/media/downloadab-le/files/samples/b/r/brosch_foerderprogramm_nawaro_web_2012.pdf		(2014)
Other areas, please specify	NRSB2030 funding programme: “Bioökonomie International” (https://www.ptj.de/biooekonomie)	International cooperation is needed to achieve the objectives set out in the National Research Strategy BioEconomy 2030. The "Bioeconomy international 2014" activity provides funding for research and development projects that are carried out in close cooperation with relevant foreign partners in order to strengthen existing and establish new international artnerships/collaborations. Socioeconomic aspects and systemic approaches are important criteria in addition to technological issues and development goals.	see above
	NRSB2030 funding programme: “GO-Bio Gründungsoffensive Biotechnology” (https://www.ptj.de/biooekonomie)	The “Gründungsoffensive Biotechnologie” (GO-Bio) was launched in 2005 to stimulate start-up activities in biotechnology. The GO-Bio competition is helping scientists in biotechnology to bring their ideas to the marketplace.	see above
	NRSB2030 funding programme:“KMU-innovativ: Biotechnologie – BioChance (https://www.ptj.de/biooekonomie)	Since 2007, BMBF has offered the funding initiative "KMU-innovativ" for the innovative SMEs target group. With "KMU-innovativ", BMBF is pursuing the goal of strengthening the innovation potential of small and medium-sized enterprises in cutting-edge research while making research funding more attractive, particularly for first-time applicants.	see above

*** The budget of the Förderprogramm Nachwachsende Rohstoffe encompasses all activities; no budget is earmarked for specific activities. So the budget of 61 M € in 2014 can count only once.**

The budget specified for the National Research Strategy Bioeconomy 2030 encompasses all funding programmes marked with the acronym NRSB2030

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

Links: www.bmbf.de/pub/Biooekonomie-in-Deutschland.pdf (in german only)

- Collaborative project: Trans-SEC - Innovation strategies for securing food supplies by means of technology and knowledge transfer: A human-centered approach.
  The Collaborative project consists of 7 sub-projects: (FKZ 031A249 A-G), http://foerderportal.bund.de/foekat/jsp/StartAction.do,
- Collaborative project: Wetlands - Wetlands in East Africa: Balancing future food production and nature conservation.
  The Collaborative project consists of 8 sub-projects: (FKZ 031A250 A-H), http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Collaborative project: HORTINLEA - Horticultural Innovation and Learning for Improved Nutrition and Livelihood in East Africa.
  The Collaborative project consists of 11 sub-projects: (FKZ 031A248 A-K), http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Collaborative project: RELOAD - Reducing post-harvest food losses - Adding value in East African food supply chains.
  The Collaborative project consists of 4 sub-projects: (FKZ 031A247 A-D), http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Collaborative project: BiomassWeb - Improving food security in Africa through increased system productivity of biomass-based value webs.
  The Collaborative project consists of 9 sub-projects: (FKZ 031A258 A-I), http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Collaborative project: UrbanFoodPlus - African-German partnership to enhance resource use efficiency and improve food security in urban and peri-urban agriculture of West African cities.
  The Collaborative project consists of 4 sub-projects: (FKZ 031A242 A-D), http://foerderportal.bund.de/foekat/jsp/StartAction.do

- Collaborative project: Exploring Triticeae genomes on the basis of an advanced draft of the barley genome.
  The Collaborative project consists of 4 sub-projects: (FKZ 0315954A-D), http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Collaborative project: Taraxacum koksaghyz as a sustainable local source for latex, rubber and inulin (TARULIN).
  The Collaborative project consists of 9 sub-projects: FKZ 0315971A-I, http://foerderportal.bund.de/foekat/jsp/StartAction.do

- Collaborative project: Exploration of the Vavilov Research Institute of Plant Industry Taraxacum koksaghyz germplasm collection: enhanced generation

and development of elite breeding material for high quality rubber production, (EVITA).
The Collaborative project consists of 4 sub-projects: 031A285A-D, http://foerderportal.bund.de/foekat/jsp/StartAction.do

- German Plant Phenotyping Network (DPPN).
  The goal of the German Plant Phenotyping Network (DPPN) is the establishment of new concepts and technologies for phenotyping, phenotyping standards, productive and efficient infrastructure, robust portfolio of phenotyping approaches, at the partner institutions to support German and international developments in plant sciences.
  The network project consists of 3 sub-projects: (031A053A-C), http://foerderportal.bund.de/foekat/jsp/StartAction.do

- Competence network: Synbreed - Synergistic Plant and Animal Breeding. The Competence network consists of 9 sub-projects: (0315528A-I). http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Competence network: FoCus - Food Chain Plus - Identification and utilisation of health promoting ingredients in milk and dairy products.

  The Competence network consists of 8 sub-projects: (FKZ 0315538A-B, 0315537A-C, 0315540 A-C).
  http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Competence network: PHÄNOMICS - a system biological approach of genotype-phenotype-distinction in the context of farm animal performance, health and welfare in cattle and pig.
  The Competence network consists of 10 sub-projects: (FKZ 0315561A-J) http://foerderportal.bund.de/foekat/jsp/StartAction.do

- Model and demonstration project: Collaborative Project: Innovative processes for an efficient enzyme production (Innozym). The Fraunhofer Center for Chemical-Biotechnological Processes CBP in Leuna closes the gap between pilot plant and industrial implementation. By making infrastructure and plants / miniplants available, the Fraunhofer CBP makes it possible for cooperation partners from research and industry to develop and scale processes for utilizing renewable raw materials up to an industrial scale.
  The Collaborative project consists of 5 sub-projects: (FKT 0315510 A-E), http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Model and demonstration project: Demonstration-scale cellulosic ethanol production plant. This Clariant pilot plant produces bioethanol from agricultural residue. 4500 tons of straw are to be refined into 1000 tons of bioethanol each year. The pilot plant is expected to show how this process can be implemented commercially and on a large scale. (Clariant Produkte (Deutschland) GmbH, (FKZ 0315842),
  http://foerderportal.bund.de/foekat/jsp/StartAction.do

- Collaborative project: CallBio - Resistant Plants for simplified Bio-ethanol Production through optimized Biosynthesis of the Cell Wall Polymer Callose

(FKZ 0315521A), http://foerderportal.bund.de/foekat/jsp/StartAction.do

- Collaborative project: BioEnergy 2021: Development of an anaerobic biotransformation process for the conversion of lignocellulose to hexanol (FKZ 0315518), http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Collaborative Project: The Golgi Glycan Fabric (FKZ 031A162) http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Collaborative Project: Cell-free in vitro-screening technology based on flow cytometry of vesicles for direct evolution (FKZ 031A165). http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Collaborative Project: Microbial electrosynthesis - An integrated research project for the utilization of electric energy in microbial production processes. (FKZ 031A226) http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Collaborative Project: Using solar energy for bio-electrocatalysis - Development of a photo-bioreactor.
  The Collaborative project consists of 2 sub-projects: (FKZ 031A154 A+B). http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Structural project Biotechnology 2020+ initiative: Cell-free bioproduction - Establishing a bioproduction-plant for cell-free protein synthesis with integrated energy supply.
  Leadproject Fraunhofer Association with more than 8 institutes (FKZ 0315942). http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Strategic alliance “Zero Carbon Footprint”: Biotechnological utilization of high-carbon waste-flows like sewage or flue gas from coal-fired power stations.
  The strategic alliance consists of 7 sub-projects: (031A217 B-H). http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Strategic alliance “FuPol” - Functional Polymers. Production of concrete plasticizers on base of renewable raw materials, novel functionalization of polymer fibres, development of cleaning enzymes for polymer fibres.
  The strategic alliance consists of 6 sub-projects: (FKZ 031A227A-F) http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Strategic alliance “NatLifE” - Ingredients for food and cosmetics from natural sources
  The strategic alliance consists of 5 sub-projects: (031A206A-E), http://foerderportal.bund.de/foekat/jsp/StartAction.do
- Leading Edge Cluster Bioeconomy :Subproject "Ligninbasierte Phenolharzsysteme zur Herstellung von Sandwichelementen für das Bauwesen (LignoSandwich)" Lignin based phenolic resin systems for the production of sandwich elements for construction
  (FKZ 031A074A-G) http://foerderportal.bund.de/foekat/jsp/StartAction.do
- KMU-innovativ-11 Collaborative project: Development of new breeding and production processes for Cypripedium Paphiopedilum.
  The collaborative project consists of 3 sub-projects: (FKZ 031A419A-C) http://foerderportal.bund.de/foekat/jsp/StartAction.do
- KMU-innovativ-8 Collaborative project: Production of complex milk sugars for functional foods. (FKZ 0316153).
  http://foerderportal.bund.de/foekat/jsp/StartAction.do

- VIP project: Bio-Nylon: Sustainable production of biobased adipic acid as platform chemical (FKZ 03V0757)
  http://foerderportal.bund.de/foekat/jsp/StartAction.do

- Regional Growth Core “PlantsProFOOD – Foods from Blue Sweet Lupines.
  Growth core with 10 subprojects (03WKBV01A, 03WKBV02A-F, 03WKBV03A-B, 03WKBV04A), http://foerderportal.bund.de/foekat/jsp/StartAction.do

- Forschungsverbund: Integrierte chemisch-biotechnologische Herstellung von Synthesebausteinen auf Basis nachwachsender Rohstoffe in einer Bioraffinerie – Joint project on integrated chemical-biotechnological production of biomass-based synthetic building blocks in a biorefinery
  http://www.fnr.de/projekte-foerderung/projekte/suche/ insert FKZ: 22027407
  http://www.cbp.fraunhofer.de/de/projekte/projekt-bioproduktion.html

- Verbundvorhaben: Lignocellulose-Bioraffinerie - Aufschluss lignocellulosehaltiger Rohstoffe und vollständige stoffliche Nutzung der Komponenten (Phase 2), Joint project: Lignocellulose biorefinery – Desintegration of lignocellulosic raw materials and complete usage of all components.
  http://www.fnr.de/projekte-foerderung/projekte/suche/ insert FKZ: 22029508 (coordinating project)
  The Joint project consists of 15 sub-projects. FKZ 22019009, FKZ 22019109, FKZ 22019209, FKZ 22019309, FKZ 22019409, FKZ 22019509, FKZ 22019609, FKZ 22019709, FKZ 22019809 , FKZ 22019909, FKZ 22020009, FKZ 22020109, FKZ 22020209, FKZ 22022109

- Verbundvorhaben: Fermentative Produktion von Edukten für Bulkchemikalien, Teilvorhaben 2: Fermentative Produktion von 3-Hydroxy-Isobuttersäure für die Herstellung der Bulk-Chemikalie Methylmethacrylat – Joint project on production of educts for bulk chemicals via fermentation, sub-project 2: production of 3-hydroxy-isobutyric acid for the manufacturing of the bulk chemical methylmethacrylate.
  http://www.fnr.de/projekte-foerderung/projekte/suche/ insert FKZ: 22027805

- Verbundvorhaben: Fermentative Herstellung von Feinchemikalien auf Zuckerbasis via Pyruvat am Beispiel des Valins, Teilvorhaben 2: Bioprozessentwicklung im Labormaßstab – Joint project on the production (fermentation) of fine chemicals from sugars via pyruvate taking valine as an example, sub-project 2: Laboratory scale bioprocess development.
  http://www.fnr-server.de/ftp/pdf/berichte/22000304.pdf (final report) or via http://www.fnr.de/projekte-foerderung/projekte/suche/ insert FKZ: 22000304

- ERANet WoodWisdomNet+ funded project: Cascading Recovered Wood – CaReWood: The CaReWood project will introduce an up-grading concept for recovered solid timber as a source of clean and reliable secondary wooden products for the European industry. The objective is to develop and evaluate techniques for converting large dimension recovered wood into new, large dimension solid wood products to complement the solid wood currently used in the furniture, interior fitting and construction sectors. http://www.woodwisdom.net/mm_files/do_881/WW-News01-2014_low.pdf

- Verbundprojekt Polymere Tenside aus nachwachsenden Rohstoffen mit optimierten Performance-Eigenschaften. Joint project on biomass-based poly-

mer surfactants with optimized performance). http://www.fnr.de/projekte-foerderung/projekte/suche search for „Polymere Tenside“

- Züchtung und Anbau von Kaukasischem Löwenzahn (Taraxacum koksaghyz) - Von der Wildpflanze zum nachwachsenden Industrierohstoff (TAKOWIND) (Breeding and cultivation of Caucasian Dandylion (*Taraxacum koksaghyz)* for rubber production http://www.fnr.de/projekte-foerderung/projekte/suche/ insert FKZ: 22002112 or search for “Löwenzahn”

- Bioconcept-Car – Development and testing of biopolymer and biocomposite based automotive parts and components for the automotive sector. http://biowerkstoffe.fnr.de/bioconcept-car/bioconcept-car/ and http://www.fourmotors.com/

- Haftklebstoffe auf Basis nachwachsender Rohstoffe. Biomass based adhesives;
  http://www.fnr-server.de/ftp/pdf/berichte/22018011.pdf
  http://www.fnr.de/projekte-foerderung/projekte/suche/ insert FKZ: 22018011

- Biopolymernetzwerk (Biopolymernetwork) - The Biopolymernetzwerk at the Agency of Renewable Resources is the information and communication platform for business, science, politics, government and public in the field of bio-based materials and their applications. As a result of the Action Plan of the Federal Government for the use of renewable resources, the activities the network shall provide meaningful and sustainable support in the use of bio-based materials and their applications. This also includes a critical examination of all upstream and downstream processes and economic, environmental and social issues. http://biopolymernetzwerk.fnr.de/

- Initiative Nachhaltige Rohstoffbereitstellung für die stoffliche Biomassenutzung (INRO) – Initiative Sustainable Supply of Raw Materials for the Industrial Use of Biomass. http://www.inro-biomasse.de/en.htm

- Verbundvorhaben: AUFWIND - Algenproduktion und Umwandlung in Flugzeugtreibstoffe: Wirtschaftlichkeit, Nachhaltigkeit, Demonstration
  Joint project: Algae production and conversion to aviation fuels: economic feasibility, sustainability and demonstration
  http://energiepflanzen.fnr.de/projekte/algen/aufwind/

- Model and Demonstration projects - Model Project "Demonstration Farms Integrated Plant Protection"
  An important aspect of Germany's National Action Plan for sustainable use of plant protection agents/pesticides is the consequent implementation of integrated pest management (IPM) strategies on farm level. This is funded by the Ministry of Food and Agriculture (BMEL) and managed by the Federal Office for Agriculture and Food (BLE). Demonstration Farms Utilize Newest IPM Techniques
  Selected demonstration farms in different regions of Germany utilize and demonstrate the newest IPM techniques available for important agricultural crops. The IPM methods used are made accessible to a wide audience by publications in professional journals, farming magazines, field trips with demonstrations, and farm days open to the public.
  Access to the best available advisory support and on-farm supervision provided by the plant protection services of the German federal states is fundamental for the utilization of modern IPM techniques. This support is adjusted to farm-level requirements providing information on the newest techniques

and means of implementation.

- BÖLN-Study: “Climate impact and sustainable farming systems – Analysis within a network of pilot project farms” (Support code 06OE160,06OE353).
  The aim of the project is the ecological evaluation of different farming systems. With the help of simulation models (REPRO, Gas-EM), measurements (e.g. gasometry, feed samples) and indicators (nutrient and humus content, energy efficiency, soil compaction, greenhouse gas emissions) the different farms will be described concerning their sustainability and opportunities for improvement will be identified. Besides the findings of the project will become part of advisory services for farms and will therefore contribute to the further development of Organic farming in the field of climate impact and sustainability.

- Innovation Support Programme - Application of plasma technology for gentle preservation of perishables in the post-harvest chain
  "Production and processing of fresh fruits and vegetables require efficient, rapid and safe sanitization measures. The economic losses in perishable production due to deterioration are considerably high. Among the most frequent reasons is the microbial contamination affecting the products all through the processing chain, i.e. from field to retail. Also, contaminated products lead to consumer health risks.
  In the R&D consortium, FriPlas partners from research and industry are on track in developing a cold plasma based process technology for post-harvest disinfection of fruit and vegetables. This technology in combination with an online detection system aid to boost the quality and safety/shelf life of the fresh produce. Participation and collaboration with industry enhances the innovation potential of the project and a quick transfer of the new process technology into practice is envisaged."

- *Global Food Security and International research Cooperation
  MACSUR - Modelling European Agriculture with Climate Change for Food Security

  MACSUR is a project within FACCE-JPI (Joint Programming Initiative for Agriculture, Climate Change, and Food Security). It gathers the excellence of existing research in livestock, crop, and trade science to describe how climate variability and change will affect regional farming systems and food production in Europe in the near and the far future and the associated risks and opportunities for European food security.
  71 organizations from 17 European countries plus Israel participate in the project. The overarching challenge is to develop a pan-European capability in the development, use and interpretation of models to perform risk assessments of the impacts of climate change on European agriculture. The project focuses on the technical and informational integration of suitable existing models and their application in regional case studies that reflect the European diversity in soil, climate, socio-economy and agricultural systems.
  MACSUR plans close co-operation with other international research networks and the involvement of political stakeholders. Expected outcomes of the project is a procedure for integrating models, assessment of food security in European case studies, and an assessment of how uncertainty in food security could be reduced further.

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emissions	5 (3)	JPI FACCE	Joint Research Programming Initiative on Agriculture, Food Security and Climate Change, especially a transnational call on Agricultural greenhouse gas mitigation and a transnational call on climate smart agriculture
	5	ERA-Net CORE Organic	Coordination of European Transnational Research in Organic Food and Farming Systems
Resource efficiency	4	ERA-Net ICT	ERA-NET spanning three FP7 themes: Agriculture and food supply; Environment and climate; and Information and Communication Technology Special transnational call on Sensor Techniques
Renewable resources/ bio-based products	5	ERA-IB 2, (ERA-Net for industrial Biotechnology R&D) www.era-ib.net	
	5	WoodWisdomNet+ (ERA-Net + for the wood and forestry sector) http://www.woodwisdom.net/	
	5	SCAR Strategic Working Group on Sustainable Bioresources for a Growing Bioeconomy (SCAR SWG SBGB)	
Knowledge transfer and good	4	ERA-Net CORE Organic	See above

practice and innovation			
Economic/ market framework			
Policy framework	4	SCAR Foresight	BLE is chair of the SCAR Foresight group
Healthy food research	3	JPI HDHL ERA-Net SUSFOOD	Joint Research Programming Initiative on a healthy diet for a healthy life, especially a transnational call for proposals on Bi-omarkers in Nutrition and Health ERA-Net on sustainable food production and consumption
Bioenergy	5	ERA-Net Bioenergy http://www.eranetbioenergy.net ERA-Net + BESTF http://eranetbestf.net/home/ ERA-Net + BESTF 2 http://eranetbestf.net/two/	
Animal feed	3 (4) 3	ERA-Net ANIHWA CWG SAP	ERA-Net on animal health and welfare of farm animals, including fish and bees Collaborative Working Group on Sustainable Animal Production
Development of an agreed methodology for environmen-tal footprints	2 2	JPI FACCE ERA-Net ICT AGRI	See above
Biorefineries	5	SCAR Collaborative Working Group (CWG) Integrated Biorefineries	This joint initiative may lead to international cooperation in R&D&I since the aim is to identify R&D areas of common interest.
Food security	4	JPI HDHL ERA-Net SUSFOOD JPI FACCE	See above

Social inclusion			
Algae			
Genetics	2	Programme on Biodiversity CWG SAP	
Other areas, please specify	3	ERA-Net SUMFOREST	ERA-Net on sustainable forest management; Multifunctional Forestry, European Forest Policy
	3	ERA-Net COFASP	Strengthening Cooperation in European Research on sustainable exploitation of marine resources in the seafood chains
	5	ETB-PRO	European Programme for transnational R&D&I cooperations of Biotech SMEs
	4	ERASysBio+	The consolidation of systems biology research stimulating the widespread adoption of systems approaches in biomedicine, biotechnology, and agri-food
	5	ERASynBIO	Development and Coordination of Synthetic Biology in the European Research Area
	4	PreSto GMO ERA-Net	Preparatory steps toward a GMO research ERA-NET

- Involvement of programmes / projects with European Dimension (cross boarder)

No 6 : “Global Food Security and International Research Cooperation”
No 4: “Federal scheme for organic farming and other forms of sustainable agriculture (BÖLN-Core Organic)*

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

SCAR
Standing Committee on Agricultural Research

Strategic Working Group on Biomass

DK - DENMARK

Joint Survey on National Bioeconomy Strategies

Country:	**Denmark**
Year of data collection:	2014
Contact mail person in charge of data collection:	Lasse Juul-Olsen, lasjuu@naturerhverv.dk

This survey consist of two parts. It is aimed to collect data on:

(13) National Bioeconomy Policies and

(14) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

The Danish Government adheres to the definition of bioeconomy outlined by the EU Commission.

From the Danish version of the "Government's growth plan for water, bio and environmental solutions":

"Rising food shortages as a result of increasing population growth and pressure on arable land means that we must use our biological resources far more effectively. Therefore the bio-based solutions - or the bioeconomy - play a vital part of the green transition Denmark and the rest of the world need.

Bioenergy is what most people have heard of. But the potentials of the bioeconomy are broader than that. The potential for bio-based solutions are found in areas such as food, energy and the textile sector as well as in the chemical, pharmaceutical and biotech industries".

Please describe where your country's definition is different from the EU definition of the bioeconomy.[37]

[37] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY

Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy

	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	4	
Food security/ land-use competition	3	
Healthy diet	2	
Independence from fossil resources/security of supply	5	The current crisis in Ukraine has highlighted the importance of increasing the security of energy supply. The Danish government has a goal of 100 % renewable in the energy and transport system by 2050.
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	4	
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	5	
Maintaining business base and employment	5	
New business, increased employment	5	According to the “Government’s growth plan for water, bio and environmental solutions”. An English summary of the plan is available here: 12-03-13-summary-p lan-for-growth-for-wa
Mitigation of climate change/adaptation to climate change	4	The government’s climate change mitigation target is to cut the emissions of greenhouse gas by 40% by 2020 compared to the level in 1990.

Environmental protection/ environmental sustain-ability (i.e. biodiversity and ecological services)	4	The government recently launched a resource efficiency strategy which includes increased production of biogas based on organic waste as supplement to agricultural manure.
Resource efficient economy (reduction of waste, use of residues)	4	
Societal demand	4	
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	No	Name of the strategy: We do not have a national bioeconomy strategy but a strategic framework for the bioeconomy engagement of the government, presented in the "Government's plan for growth for water, bio and environmental solutions" and the "Government's plan for growth for food" (no English summary available for the latter plan for growth). 12-03-13-summary-p lan-for-growth-for-wa Link: http://www.evm.dk/english/publications/2013/12-03-13-summary-plan-for-growth-for-water-bio Throughout the years various initiatives have touched upon bioeconomy related areas, such as the two RUFF biotech reports, from 2004 on food (http://www.netpublikationer.dk/dffe/3859/html/chapter03.htm, with English abstract) and 2006 on non-food (http://www.netpublikationer.dk/DFFE/6397/html/entire_publication.htm#Chapter2 with English abstract) , the 2008 Research2015 (http://ufm.dk/en/publications/2008/research2015-2013-a-basis-for-prioritisation-of-strategic-research), various green growth plans, as well as Research2020 from 2012 (http://ufm.dk/en/publications/2012/research2020).
Ministry(ies) in charge of the Bioeconomy strategy ?	N/A	Name of the responsible Ministry/ Ministries: The coordination of bioeconomy related issues is discussed between the five ministries present in the National Bioeconomy Panel. The chair of the panel is the director of the Danish AgriFish Agency under the Ministry of Food, Agriculture and Fisheries. Link: http://naturerhverv.dk/tvaergaaende/forskning/biooekonomi/
Does your country have a Bioeconomy advisory body/panel ?	Yes	Name of the body: The National Bioeconomy Panel

		Link: http://fvm.dk/fileadmin/user_upload/FVM.dk/Nyhedsfiler/Nationale_Biooekonomi-panel-faktaark.pdf
Does your country have a Bioeconomy agency or agencies ?	No	Name of the agency: Link:
Does your country have a Bioeconomy observatory collecting data/info ?	No	Name of the body: Link:
Does your country have a Bioeconomy National Contact point ?	Yes	Name: Lasse Juul-Olsen, Danish AgriFish Agency Contact: lasjuu@naturerhverv.dk With regards to The Ministry of Higher Education and Science (including “The Danish Innovation Foundation”), the contact point is Niels Gøtke (nigoe@fi.dk).

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[38]
Agriculture	Yes / No	Coming. The Government is working on a follow up to the 44 recommendations presented by the "The Commission on Nature and Agriculture" in April 2013. 1 of the recommendations concerns "Conscious focus on utilizing biomass for energy and other bio-based products".	
Forestry	Yes	Danish national forest programme in an international perspective.	http://naturstyrelsen.dk/publikationer/2008/dec/the-danish-national-forest-programme-in-an-international-perspective/
Marine/Fisheries/Aquaculture	Yes / No	Strategy for sustainable development of aquaculture 2014-2020 (acc. to Art 34 og Reg 1380/2013 on Common Fisheries Policy) will be adopted in August 2014	
Waste	Yes	The Danish Resource Strategy 2013 aims to reduce incineration and increase the recycling of biomass from households	http://eng.mst.dk/media/mst/Attachments/Ressourcestrategi_UK_web.pdf
Agri-Food & Food security	Yes	The plan for growth for food takes into account the recommendations of the "Growth Team on Food", and is aligned with the overall framework on bioeconomy as presented in the"plan for growth for water, bio and environmental solutions". The plan covers aspects such as resource efficiency, sustainable food production and increased sustainable biomass production.	http://www.evm.dk/~/media/oem/pdf/2013/2013-publikationer/16-12-13-vaekstplan-for-foedevarer/vaekstplan-for-foedevarer.ashx
Food, Healthy diet	Yes	Action Plan for organic production towards 2020	http://en.fvm.dk/focus-on/organic-production/

[38] Please provide English link (if available)

Research & Innovation	Yes	Strategy for Green Development and demonstration programme (GUDP) Strategic initiatives as part of the agreement on research based public sector consultancy agreements between universities and the ministry of food, agriculture and fisheries	• **Green Development and demonstration programme (GUDP)** Link: http://naturerhverv.dk/fileadmin/user_upload/NaturErhverv/Filer/Indsatsomraader/GUDP/GUDP-bestyrelsen/Green_Development_and_Demonstration_Programme.pdf • **Research 2020 – Strategic Research Horizons (Research2020 is not a strategy but an inspiration and prioritisation framework for new investments in strategic research areas)** The catalogue contains five visions and 14 themes which identify promising strategic research areas for Denmark. The Visions and themes target areas where Danish research and new knowledge may be the driving force in the development of prosperity or contribute to solving significant societal challenges. Research2020 formed the basis for decision when the Danish Parliament decided how to allocate the strategic funding of research. The Danish Parliament allocated strategic funding to the Research2020 theme "Bio-Resources, Food and other Biological Products" (DKK 94 million) . The theme aims is to support a competitive, environmentally-efficient and health-promoting production of food and other biological products. Link: http://ufm.dk/en/publications/2012/files-2012/research2020.pdf

			• **INNO+ Catalogue (INNO+ is not a strategy but a inspiration and prioritisation framework for new investments in innovation)** The INNO+ Catalogue identifies promising focus areas for strategic investments in innovation. The catalogue is designed as an inspiration and prioritisation framework for new intelligent investments in innovation.The focus areas target fields where Denmark has particular industrial and research strengths and capabilities. The INNO+ Catalogue contains six main thematic areas, subdivided into a total of 21 focus areas. One of the the main thematic areas is Innovative Food Production and Bio-Economy. On the basis of the Inno+ cataloque five societal partnerships innovation have been launched in 2014. One of them is a societal partnership on Smart, sustainable and efficient plant comprising companies, knowledge institutions and public authorities (DKK 30-50 mio). Link: http://ufm.dk/en/publications/2013/inno-catalogue
Green Growth Strategy	Yes	This plan for growth aims to strengthen and cultivate the Danish and European markets for resource-efficient solutions within water, bio and environmental solutions. The plan establishes a strategic framework for strengthening the potential for future market pull for biobased solutions to generate growth and employment in Denmark. 7 initiatives are outlined in the plan of which 1 includes the establishment of a national bioeconomy panel.	12-03-13-summary-plan-for-growth-for-wa
Blue Growth Strategy	Yes / No	Plan for growth for the Blue Denmark A vision for the maritime sectors including developments in Danish harbours, education and innovation. This plan does not specifically cover bioeconomy-	http://www.evm.dk/publikationer/2012/~/media/oem/pdf/2012/publikationer-2012/12-12-12-vaekstplan-for-det-blaa-danmark/danmark-i-arbejde-vaekstplan-for-det-blaa-danmark.ashx

		related areas.	
Energy, including Bioenergy	Yes	The Danish government has an ambitious strategy for the energy sector containing goals for renewable energy in 2020. The plan also points at the government´s aim for a fossil free energy and transport system in 2050. The strategy is the foundation for the Energy Agreement from March 2012 between the Government and the majority of the parliament.	Energy strategy (Our Future Energy): http://www.ens.dk/sites/ens.dk/files/policy/danish-climate-energy-policy/our_future_energy.pdf Energy Agreement: http://www.ens.dk/sites/ens.dk/files/dokumenter/publikationer/downloads/accelerating_green_energy_towards_2020.pdf
Industry, Enterprise	Yes	This plan for growth aims to strengthen and cultivate the Danish and European markets for resource-efficient solutions within water, bio and environmental solutions. The plan establishes a strategic framework for strengthening the potential for future market pull for biobased solutions to generate growth and employment in Denmark. 7 initiatives are outlined in the plan of which 1 includes the establishment of a national bioeconomy panel.	12-03-13-summary-plan-for-growth-for-wa
Environment (incl. resource efficiency, sustainability, water use)	Yes	Plan for growth for water, bio and environmental solutions. The Danish Resource Strategy 2013 aims to reduce incineration and increase the recycling of biomass from households.	12-03-13-summary-plan-for-growth-for-wa http://eng.mst.dk/media/mst/Attachments/Ressourcestrategi_UK_web.pdf
Eco-System Services	Yes / No	A general strategy for biodiversity and nature protection is under development and includes implementation of the EU biodiversity targets i.e. target on green infrastructure protection and restoration of ecosystems and ecosystem services.	

		The Rural Development Programme will include a focus on increasing resource efficiency and realizing the potentials of the bioeconomy.	http://naturerhverv.dk/fileadmin/user_upload/NaturErhverv/Filer/Tvaergaaende/EU-arbejdet/Forslaget_til_Landdistriktsprogram_2014-2020_2.pdf (p. 87-88).
Regional development and Smart Specialisation	Yes	In 2014-2020 the ESI-funds will support the transition towards a bioeconomy as described in the partnership agreement between Denmark and the European Commission.	For example small and medium sized enterprises' transition towards resource efficiency and a low carbon economy can be supported by the European Regional Fund (see http://regionalt.erhvervsstyrelsen.dk/regionalfonden_og_socialfonden).
Education/Skills	No		
Other areas, please specify	Yes	Climate Change Mitigation Plan	The Danish government's climate target is to cut greenhouse gas emissions by 40% by 2020 in relation to 1990. Climate Action Plan: http://www.ens.dk/sites/ens.dk/files/policy/danish-climate-energy-policy/danishclimatepolicyplan_uk.pdf Analysis of possible climate change mitigation measures: http://www.ens.dk/sites/ens.dk/files/policy/danish-climate-energy-policy/dk_climate_change_mitigation_uk.pdf

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name*	**Description of the focus/specialisation**[39]	**Link**[40]
Biocluster.dk	1, 2, 3, 4.	http://biocluster.dk/
INBIOM	1, 2, 3, 4.	http://ufm.dk/en/research-and-innovation/cooperation-between-research-and-innovation/collaboration-between-research-and-industry/innovation-networks-denmark/list-of-danish-innovation-networks http://www.inbiom.dk/en/homepage/homepage.htm
Danish Food Cluster	2	http://danishfoodcluster.dk/
BIOVALUE SPIR	1,2,3,4	http://ufm.dk/en/research-and-innovation/funding-programmes-for-research-and-innovation/who-has-received-funding/spir-grant-2012-within-the-bio-based-society-bio-value http://strategiskforskning.dk/, http://biovalue.dk/

* This is not a complete list of bioeconomy clusters in Denmark - the listed bioeconomy clusters serve as examples only.

[39] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[40] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	Green Development and Demonstration Programme (GUDP) Programmes financed from the promille and production levy funds Research based public sector consultancy agreements between universities and the ministry of food, agriculture and fisheries InnovationsFonden / Danish Innovation Foundation supports strategic research within the	http://naturerhverv.dk/fileadmin/user_upload/NaturErhverv/Filer/Indsatsomraader/GUDP/GUDP-bestyrelsen/Green_Development_and_Demonstration_Programme.pdf Ad levy funds: http://www.promilleafgiftsfonden.dk/Andre_fonde.aspx *(Private investments and loan-financing are rarely used in Denmark as a way to support food research. This can also be said of "tax incentives", which are used directly. However, the resources in the promille and production levy funds derive from rates and dues on certain forms of production. It has been agreed by the government that these resources shall be returned not to individual producers but to the private sector to support the development of this sector. Research of relevance for the sector is one of the way to return these "taxes".)* The aim of the programme is to support a competitive, environmentally-efficient and health-promoting production of food and other biological products. The programme support research within following themes: • The connection between food, health and lifestyle • Bioresources, biorefinery, agriculture food and other biological products, including production systems and processes within the food industry • Organic food production. The aim is to develop competitive, energy efficient and renewable energy systems which will be able to meet future energy needs and environmental requirements. The aim is further-	DKK 197 Million/ 26,4 mio. Euro in 2014

	area of Health, Food and Welfare. InnovationsFonden / Danish Innovation Foundation supports strategic research within the area of Sustainable Energy and Environment.	more to develop environment-efficient technologies which will strengthen business competitiveness and contribute to a cleaner environment. The programme support research within: Future sustainable energy technologies and systems and competitive environmental technologies and solutions. This includes biorefining, biogas, bioenergy and heat produced from biomass. call-phase-1-2014-en-final (3).pdf	DKK 297 million/ 39,8 mio. Euro in 2014.
Forestry	InnovationsFonden / Danish Innovation Foundation supports strategic research within the area of Sustainable Energy and Environment. Forest and landscape research and consultations from Copenhagen University	The aim is to develop competitive, energy efficient and renewable energy systems which will be able to meet future energy needs and environmental requirements. The aim is furthermore to develop environment-efficient technologies which will strengthen business competitiveness and contribute to a cleaner environment. The programme support research within: Future sustainable energy technologies and systems and competitive environmental technologies and solutions. This includes biorefining, biogas, bioenergy and heat produced from biomass. call-phase-1-2014-en-final (3).pdf Studies on biomass production from forests.	DKK 297 million/ 39,8 mio. Euro in 2014. App 3 mill eoru/year
Marine/Fisheries/Aquaculture		The proposal for a national Operational Programme for implementing the European Maritime and Fisheries Fund will be presented to CION in 2nd half of 2014.	

	InnovationsFonden / Danish Innovation Foundation supports strategic research within the area of Health, Food and Welfare.	The aim of the programme is to support a competitive, environmentally-efficient and health-promoting production of food and other biological products. The programme support research within following themes: • The connection between food, health and lifestyle • Bioresources, biorefinery, agriculture food and other biological products, including production systems and processes within the food industry • Organic food production.	DKK 197 Million/ 26,4 mio. Euro in 2014
	InnovationsFonden / Danish Innovation Foundation supports strategic research within the area of Sustainable Energy and Environment.	The aim is to develop competitive, energy efficient and renewable energy systems which will be able to meet future energy needs and environmental requirements. The aim is furthermore to develop environment-efficient technologies which will strengthen business competitiveness and contribute to a cleaner environment. The programme support research within: Future sustainable energy technologies and systems and competitive environmental technologies and solutions. This includes biorefining, biogas, bioenergy and heat produced from biomass. call-phase-1-2014-en-final (3).pdf	DKK 297 million/ 39,8 mio. Euro in 2014.
Waste as Biomass source	InnovationsFonden / Danish Innovation Foundation supports strategic research within the area of Sustainable Energy and Environment.	The aim is to develop competitive, energy efficient and renewable energy systems which will be able to meet future energy needs and environmental requirements. The aim is furthermore to develop environment-efficient technologies which will strengthen business competitiveness and contribute to a cleaner environment. The programme support research within: Future sustainable energy technologies and systems and competitive environmental technologies and solutions. This includes biorefining, biogas, bioenergy and heat produced from biomass. The research within sustainable energy and environment also support the development of sustainable conversion technologies such as wind power and bio-energy, including waste incinera-	DKK 297 million/ 39,8 mio. Euro in 2014.

		tion, biological and thermal gasification of biomass from agriculture, forests and water environment. But also the development of technologies such as fuel cells, solar cells, wave energy, utilisation of waste, solar heating, geothermal systems, combined. call-phase-1-2014-en-final (3).pdf	
Food/feed use of biomass (food/feed value chains)	InnovationsFonden / Danish Innovation Foundation supports strategic research within the area of Health, Food and Welfare.	The aim of the programme is to support a competitive, environmentally-efficient and health-promoting production of food and other biological products. The programme support research within following themes: • The connection between food, health and lifestyle • Bioresources, biorefinery, agriculture food and other biological products, including production systems and processes within the food industry • Organic food production. The programme among other things support research within sustainable development of the biobased economy by means of plant breeding and competitive production of food, feed and other biological products, together with their uses in the production of new biological ingredients and materials capable of, for example, replacing fossil-based resources. call-phase-1-2014-en-final (3).pdf	DKK 197 Million/ 26,4 mio. Euro in 2014.
Energy use of biomass (bio-energy)	InnovationsFonden / Danish Innovation Foundation supports strategic research within the area of Sustainable Energy and Environment. Energy technology development and demonstration programme.	The aim is to develop competitive, energy efficient and renewable energy systems which will be able to meet future energy needs and environmental requirements. The aim is furthermore to develop environment-efficient technologies which will strengthen business competitiveness and contribute to a cleaner environment. The programme support research within: Future sustainable energy technologies and systems and competitive environmental technologies and solutions. This includes biorefining, biogas, bioenergy and heat produced from biomass. The program provides funding for development and demonstration projects for new innovative energy technologies. The aim is to help Denmark become independent of fossil fuels by 2050, while developing Danish commercial potential for green growth and employment. Link: http://energiteknologi.dk/en?language=en Energy in review 2013:	DKK 297 million/ 39,8 mio. Euro in 2014. 50 mio. Euro in 2014

		http://www.ens.dk/sites/ens.dk/files/energistyrelsen/energi13_uk_web.pdf	
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	InnovationsFonden / Danish Innovation Foundation supports strategic research within the area of Health, Food and Welfare. No specific program for paper and pulp or wood and products InnovationsFonden / Danish Innovation Foundation supports strategic research within the area of Strategic Growth Technologies.	The aim of the programme is to support a competitive, environmentally-efficient and health-promoting production of food and other biological products. The programme support research within following themes: • The connection between food, health and lifestyle • Bioresources, biorefinery, agriculture food and other biological products, including production systems and processes within the food industry • Organic food production. The programme also support research witin development of new biological non-food products, for example bio-production of industrial intermediary products, products and materials to replace crude oil products made in the petro-chemical industry. The research may support the development of new types of packaging for the food industry which will take health into consideration, ensure high quality and prevention of waste of food, or be aimed at the development of crops for the production of medicine, etc. The programme support research witin: Strategic growth technologies with special focus on nanotechnology, biotechnology and information and communication technology and strategic growth technologies, including production and materials technologies and information and communication technology call-phase-1-2014-en-final (3).pdf	DKK 197 Million/ 26,4 **mio.** Euro in 2014 DKK 103 million/ 13,8 mio. Euro in 2014
Key Enabling Technology (Industrial Biotechnology)	InnovationsFonden / Danish Innovation Foundation supports strategic research within the area of Strategic Growth Technolo-	The programme support research witin: Strategic growth technologies with special focus on nanotechnology, biotechnology and information and communication technology and strategic growth technologies, including production and materials technologies and information and communication technology	DKK 103 million/ 13,8 mio. Euro in 2014

	gies. InnovationsFonden / Danish Innovation Foundation supports strategic research within the area of Sustainable Energy and Environment.	The aim is to develop competitive, energy efficient and renewable energy systems which will be able to meet future energy needs and environmental requirements. The aim is furthermore to develop environment-efficient technologies which will strengthen business competitiveness and contribute to a cleaner environment. The programme support research within: Future sustainable energy technologies and systems and competitive environmental technologies and solutions. This includes biorefining, biogas, bioenergy and heat produced from biomass. call-phase-1-2014-en-final (3).pdf	DKK 297 million/ 39,8 mio. Euro in 2014.
Communication, stakeholder involvement			
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

Examples of more general studies and links to project funding websites

"The ten-million-tonne plan" http://news.ku.dk/all_news/2012/2012.6/denmark_can_triple_its_biomass_production_and_improve_the_environment/ , http://curis.ku.dk/ws/files/47425822/timioplanuknet.pdf

"HAVET – EN UUDNYTTET RESSOURCE?" (not available in English – a knowledge synthesis on the resources from the oceans) - http://fvm.dk/fileadmin/user_upload/FVM.dk/Dokumenter/Servicemenu/Publikationer/Havet_-_en_uudnyttet_ressource.pdf

- Analysis of Bioenergy in Denmark http://www.ens.dk/sites/ens.dk/files/undergrund-forsyning/el-naturgas-varmeforsyning/Energianalyser/nyeste/bioenergi_uk.pdf;
- Imprted wood fuels http://www.ens.dk/sites/ens.dk/files/undergrund-forsyning/vedvarende-energi/bioenergi/analyse-bioenergi-danmark/bentsen_stupak_2013b.pdf;
- Analysis of Biomass Prices http://www.ens.dk/sites/ens.dk/files/undergrund-forsyning/vedvarende-energi/bioenergi/analyse-bioenergi-danmark/analysis_of_biomass_prices_2013.06.18_-_final_report.pdf;
- Carbon Footprints of Bioenergy pathways for the future Danish energy system: http://www.ens.dk/sites/ens.dk/files/undergrund-forsyning/el-naturgas-varmeforsyning/Energianalyser/nyeste/carbon_footprint_of_bioeneergy_pathways_for_the_future_danish_energy_system_-_final_280314_l.pdf

Report from Agrobiosam on biobased economy including case-studies: http://www.biorefiningalliance.com/uploads/Rapport%20web%20agrobiosam.pdf

RUFF-strategy: http://www.netpublikationer.dk/DFFE/6397/pdf/rap_forskningsstrategi_nonfood_2006_02.pdf

Project gallery for the Energy Development and Technology Programme (EUDP): http://energiteknologi.dk/en/projects?language=en

Find examples of small and medium sized enterprises' transition towards resource efficiency and a low carbon economy, supported by the European Regional Fund (see http://regionalt.erhvervsstyrelsen.dk/regionalfonden_og_socialfonden).

Examples of more specific Bioeconomy research and innovation projects*

INBICON http://www.inbicon.com/en & RENESCIENCE http://www.renescience.com/en

BioBase – a research initiative of the University of Aarhus with four research platforms (Green biomass, green protein, HTL, Societal, environmental, ecological and economic assessments http://dca.au.dk/forskning/bioraf/forskningsinitiativer/biobase/

Maabjerg Energy Concept: The Maabjerg Energy Concept envisions creating a comprehensive, sustainable energy solution, based on local and CO2-neutral raw materials, by using the latest technologies. The project merges several energy supply objectives (CHP, Biogas, Bioethanol) in a holistic system concept, where the synergy between the individual solutions is used optimally and with great effectiveness, through the utilisation and alignment of energy streams between the individual plants. http://www.maabjergenergyconcept.eu/

"Biomass for the 21st century: Integrated biorefining technologies for shipping fuels and biobased chemicals (B21st)". A platform which brings together leading players within the sustainable use of biomass. The platform provides a framework for the parties' joint research aimed at developing specific sustainable solutions for the production of building blocks for chemicals and bio-based fuels for the global shipping industry. http://news.ku.dk/all_news/2011/2010.12/new-research-platform-paves-way-for-future-bio-based-society/; http://b21st.ku.dk/

BioValue SPIR: The aim of the BIO-VALUE platform is to make sustainable solutions for biorefining technologies. BIO-VALUE deals with entire value chain from sustainable biomass production, the separation and conversion into new products. The BIO-VALUE platform has a budget of 160 million DKK to develop new sustainable technologies for upgrading plant material into internationally competitive products. Until 2018, the BIO-VALUE platform will strive to provide leading examples on how to kick-start the biobased economy with sustainable high value products, such as proteins, polymers, and chemical components for the industry. The platform is funded under the SPIR initiative by The Danish Council for Strategic Research and The Danish Council for Technology and Innovation.
http://ufm.dk/en/research-and-innovation/funding-programmes-for-research-and-innovation/who-has-received-funding/spir-grant-2012-within-the-bio-based-society-bio-value
http://strategiskforskning.dk/, http://biovalue.dk/

*In addition to the above mentioned cases, please find attachment with examples of bioeconomy related projects funded by InnovationsFonden. Not all the examples have necessarily been successful.

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions	5	FACCE JPI	
Resource efficiency	4	SUSFOOD COFASP ICT-AGRI ERA MBT	
Renewable resources/ bio-based products	5	ERA-IB2 ERA-SynBio ERA MBT ERA-CAPS SUSFOOD ICT-AGRI SCAR SWG SBGB Cooperation within the Nordic Council of Ministers	
Knowledge transfer and good practice and innovation	5	BONUS FACCE JPI JPI Oceans ICT-AGRI COFASP MBT	
Economic/ market framework	5	NKJ ICT-AGRI	
Policy framework	5	BONUS JPI Oceans FACCE JPI	

		HDHL JPI COFASP ICT-AGRI NKJ COREORGANIC	
Healthy food research	4	HDHL JPI SUSFOOD COFASP ERA MBT	
Bioenergy	5	FACCE JPI ERANet+ BESTF ERA-CAPS ERA-IB2 ERA-SynBio N-INNER	
Animal feed	4	ERA-CAPS	
Development of an agreed methodology for environmen-tal footprints	5	BONUS FACCE	
Biorefineries	5	SCAR CWG ERA-IB2 ERA-SynBio	
Food security	4	FACCE JPI SUSFOOD ERA-CAPS ICT-AGRI ERA MBT COFASP	
Social inclusion	5		
Algae	4	BONUS JPI Oceans Marine Biotech ERA-Net COFASP	

Genetics	4	ERA-IB2 ERA-SynBio ERA-CAPS ERA MBT EUPHRECO SCAR SWG SAP Cooperation within the Nordic Council of Ministers, NordGen	
Other areas, please specify			

A potential future instrument for collaboration could be COST (an intergovernmental framework for European Cooperation in Science and Technology, allowing the co-ordination of nationally-funded research on a European level. Denmark has been a member of COST since 1971. COST funds pan-European, bottom-up networks of scientists and researchers across all science and technology fields. These networks, called 'COST Actions', promote international coordination of nationally-funded research. COST e.g.has an action on Biomedicine and Molecular Biosciences (BMBS). http://www.cost.eu/domains_actions).

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

SCAR
Standing Committee on Agricultural Research

Strategic Working Group on Biomass

EE - ESTONIA

Joint Survey on National Bioeconomy Strategies

Country:	**Estonia**
Year of data collection:	2014
Contact mail person in charge of data collection:	kylli.kaare@agri.ee

This survey consist of two parts. It is aimed to collect data on:

(15) National Bioeconomy Policies and

(16) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

No

Please describe where your country's definition is different from the EU definition of the bioeconomy.[41]

[41] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	4	
Food security/ land-use competition	5	
Healthy diet	3	
Independence from fossil resources/security of supply	4	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	5	
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	5	
Maintaining business base and employment	4	
New business, increased employment	5	
Mitigation of climate change/adaptation to climate change	4	
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	4	
Resource efficient economy (reduction of waste, use of residues)	5	
Societal demand	4	
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	No	Name of the strategy: Ministry of Agriculture is currently in the process of preparing the Bioeconomy Strategy.
Ministry(ies) in charge of the Bioeconomy strategy ?	Yes	Name of the responsible Ministry/ Ministries: Shared responsibilities between the Ministry of Agriculture and the Ministry of Environment (forestry). Ministry of Agriculture is currently in the process of preparing the Bioeconomy Strategy.
Does your country have a Bioeconomy advisory body/panel ?	**No**	Name of the body: As bioeconomy is a new topic in Estonia and the preparations for the strategy are yet in process, there is no bioeconomy advisory body/panel jet. Nevertheless topics connected to bioeconomy are partly driven by the Council of Agriculture and Rural Development, the Council of Fisheries and the Council of Forestry.
Does your country have a Bioeconomy agency or agencies ?	**No**	Name of the agency: The same as above. Partly represented by the Agricultural Board, the Environmental Board. Link: http://www.keskkonnaamet.ee/eng http://www.pma.agri.ee/index.php?main=1
Does your country have a Bioeconomy observatory collecting data/info ?	**No**	Name of the body: The same as above. Partly represented by the Statistics Estonia, the Agricultural Research Centre, the Estonian Environment Agency. Link: http://www.stat.ee http://www.keskkonnaagentuur.ee/ http://pmk.agri.ee/
Does your country have a Bioeconomy National Contact point ?	**No**	Name: When Estonian Government approves Estonian Bioeconomy Strategy, then National Contact point will be Ministry of Agriculture. As the Strategy has not been approved jet, Estonia does not have bioeconomy National Contact point.

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[42]
Agriculture	**Yes**	Initiatives planned under Estonian Rural Development Plan; Estonian Organic Farming Development Plan, Action Plan to Mitigate and Adapt to Climate Change in the Agricultural Sector 2012-2020	http://www.agri.ee/et/eesmargid-tegevused/arengukavad-ja-strateegiad
Forestry	**Yes**	Full value chain from seeds to R&D in forestry, covering all Gorest Europe criteria for sustainable forest management.	http://www.envir.ee/sites/default/files/elfinder/article_files/mak2020vastuvoetud.pdf
Marine/Fisheries/Aquaculture	**Yes**	Initiatives planned under European Maritime and Fisheries Fund (action plan still in development for the new planning period of 2014-2020)	http://www.agri.ee/et/eesmargid-tegevused/euroopa-merendus-ja-kalandusfond-emkf-2014-2020/rakenduskava
Waste	**Yes**	The waste management plan for 2014–2020	http://www.envir.ee/en/waste
Agri-Food & Food security	**Yes**	Development plan of	http://www.agri.ee/et/ministeerium-kontakt/arengukava

[42] Please provide English link (if available)

		the Ministry of Agriculture and its area of government 2015-2018	
Food, Healthy diet	**Yes**	National Health Development Plan 2009-2020	https://valitsus.ee/sites/default/files/content-editors/arengukavad/rahvastiku_tervise_arengukava_2009-2020_taiendatud_2012.pdf
Research & Innovation	**Yes**	Resource efficiency topic under the Strategy of Research and Innovation	http://hm.ee/sites/default/files/tai_strateegia.pdf
Green Growth Strategy	**No**		
Blue Growth Strategy	**Yes**	Aquaculture, initiatives planned under European Maritime and Fisheries Fund (action plan still in development for the new planning period of 2014-2020)	http://www.agri.ee/et/eesmargid-tegevused/euroopa-merendus-ja-kalandusfond-emkf-2014-2020/rakenduskava
Energy, including Bioenergy	**Yes**	National Development Plan of the Energy Sector Until for 2020	https://www.mkm.ee/en/objectives-activities/energy-sector/energy-renewable-sources https://valitsus.ee/sites/default/files/content-editors/arengukavad/energiamajanduse_riiklik_arengukava_aastani_2020.pdf
Industry, Enterprise	**Yes**	Resource efficiency topic under Estonian Entrepreneurship Growth Strategy 2014-2020.	https://valitsus.ee/sites/default/files/content-editors/arengukavad/eesti_ettevotluse_kasvustrateegia_2020.pdf
Environment (incl. resource efficiency, sustainability, water use)	**Yes**	Estonian Environmental Strategy 2030	https://www.riigiteataja.ee/aktilisa/0000/1279/3848/12793882.pdf#
Eco-System Services	**Yes**	Assessment and further acknowledgement of ecosystem services under Estonian Nature	https://valitsus.ee/sites/default/files/content-editors/arengukavad/looduskaitse_arengukava_aastani_2020.pdf

		Conservation Development Plan 2020	
Regional development and Smart Specialisation	**Yes**	Resource efficiency topic under the Strategy of Research and Innovation (resource efficiency as the area for smart specialisation and growth)	http://hm.ee/sites/default/files/tai_strateegia.pdf
Education/Skills	**Yes**	Estonian Lifelong Learning Stategy 2020 focuses also on the need for growth in the number of students in natural sciences	http://www.hm.ee/en/estonian-lifelong-learning-strategy-2020
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[43]	**Link**[44]
Forest management and forest industry	From forest management (1) to production of wood-based products, wood based construction (4) and bioenergy (3)	http://www.empl.ee/index.php?lang=et http://www.rmk.ee/en http://www.erametsaliit.ee/et
Bio-Competence Centre of Healthy Dairy Products	The focus of the Bio-Competence Centre of Healthy Dairy Products (BioCC) is to enhance competitiveness and profitability of the production of healthy added-value milk and dairy products, through innovative solutions and encompassing the whole chain (feed industry, cattle breeding and nutrition, food technology, human nutrition and medicine).	http://www.tptak.ee/en/
COMPETENCE CENTER OF FOOD AND FERMENTATION TECHNOLOGIES (CCFFT)	**CCFFT** offers extensive knowledge both in food and fermentation science. The technological base of **CCFFT** is regarded contemporary and sufficient for carrying out research in the food and fermentation technology field (advanced microorganism cultivation technologies, systems biology of microorganisms, food stability, quality and healthiness, modeling human gastrointestinal tract).	http://www.tftak.eu/Home

[43] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[44] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	National Programme "National programme for plant breeding 2009-2019"	Plant breeding; developing environmentally friendly and effective plant breeding technologies. Rural economy and its sustainable development. Food safety and biological diversity	557 947€ / year
Forestry	R&D Programme of the Ministry of Environment 2020,	Productivity and vitality of forest, multiple end efficient use of forest resources	
Marine/Fisheries/Aquaculture	"Applied Research and Development in Agriculture 2009-2014"	Project "Development of rearing technology of noble crayfish for Estonia" (2006-2008) 31 956 € / year	1 259 529 € / 2013 year
Waste as Biomass source	"Applied Research and Development in Agriculture 2009-2014"	Project "Safe use of solid waste composts in agriculture" (2011-2014) 44 738 € / year	1 259 529 € / 2013 year
Food/feed use of biomass (food/feed value chains)	"Applied Research and Development in Agriculture 2009-2014"		1 259 529 € / 2013 year
Energy use of biomass (bioenergy)	"Applied Research and Development in Agriculture 2009-2014"	Project "Economic aspects of cultivation and utilization of energy crop (reed canary grass) in Estonia (2007-2010) 24 412 € / year	1 259 529 € / 2013 year
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**			
Key Enabling Technology (Industrial Biotechnology)	Estonian Biotechnology Programme http://www.eas.ee/en/for-the-	http://www.biotech.ee/index.php?page_id=41&lang_id=en http://www.eas.ee/en/for-the-entrepreneur/innovation/biotechnology/emphasis	Research funding of programme topics: 9 300 000 €

	entrepreneur/innovation/biotechnology/emphasis		Product development grants: 8 000 000 € Applied research grants of functional food: 6 400 000 € The development of human resources: 5 100 000 € Export and marketing support: 1 300 000 €
Communication, stakeholder involvement			
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

Lactobacillus Fermentum ME-3 Bacteria and the Hellus Product Line

In 1995, a UT research team led by Professor Marika Mikelsaar and Professor Mihkel Zilmer discovered the Lactobacillus fermentum ME-3 bacteria, which can rightfully be called the first Estonian probiotic lactic acid bacteria.

As of today, Lactobacillus fermentum ME-3 is a unique probiotic, since it is the only one in the world to have two sets of patented properties:
1) antimicrobial properties (direct and adverse effects on harmful bacteria)
The ME-3 bacteria reduce the risk of gastrointestinal tract infections, especially those of salmonellosis and shigellosis by attacking and neutralising various harmful bacteria in the gastrointestinal tract. In addition, the strong antioxidative properties of ME-3 reinforce the mucous membrane of the intestinal wall and inhibit the spread of infections from the gastrointestinal tract to other organs.

2) antioxidant properties (indirect beneficial effects promoting human health)
Probiotic ME-3 bacteria can be effectively combined with antimicrobial treatments, i.e., with drugs such as fluorquinolones, Metronidazole and Biseptol (TMP-SMX).

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions	5	JPI FACCE, ERA-NET Climate Smart Agriculture,ERA-Net C-IPM	Work in progress in forestry under Standing Forestry Committee.
Resource efficiency	5	ERA-Net SUSFOOD, ERA-Net C-IPM	
Renewable resources/ bio-based products	4		
Knowledge transfer and good practice and innovation	5	INTERREG projects: Baltic Deal, Baltic Manure	
Economic/ market framework	4	ERA-Net SUSFOOD	
Policy framework	4	FACCE JPI	
Healthy food research	4	EUPHRESCO II, ERA-Net Core Organic II; JPI HDHL	
Bioenergy	4		
Animal feed	3		
Development of an agreed methodology for environmental footprints	4		
Biorefineries	2		
Food security	4	FACCE JPI	
Social inclusion			
Algae			
Genetics	4	Baltic-Nordic cooperation	
Other areas, please specify Bioinformatics		ELIXIR	

EUROPEAN COMMISSION
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Strategic Working Group on Biomass

ES - SPAIN

Joint Survey on National Bioeconomy Strategies

Country:	**Spain**
Year of data collection:	2014
Contact mail person in charge of data collection:	manuel.lainez@inia.es

This survey consist of two parts. It is aimed to collect data on:

(17) National Bioeconomy Policies and

(18) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

We have set up a task force to stablish the basis of our strategy. Until now, it haven´t been decided the final definition but, after the first discussions, we can conclude that the final definition will be closer to the EU one (food, biobased products and bioenergy), with an important support to the food production and the use of residues obtained in the food chain.

Please describe where your country's definition is different from the EU definition of the bioeconomy.[45]

[45] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	3	
Food security/ land-use competition	4	
Healthy diet	4	
Independence from fossil resources/security of supply	3	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	5	
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	4	
Maintaining business base and employment	5	
New business, increased employment	4	
Mitigation of climate change/adaptation to climate change	4	
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	4	
Resource efficient economy (reduction of waste, use of residues)	5	
Societal demand	5	
Other drivers – please specify	Rural development	

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	No	Name of the strategy: Link:
Ministry(ies) in charge of the Bioeconomy strategy ?	It has been promoted by	Name of the responsible Ministry/ Ministries: Economics and Competitivines. State Secretariat of Research, Development and Innovation. It has been planned to incorporate, inmediatly, other Ministries (Agriculture, agrifood and environment , etc) Link:
Does your country have a Bioeconomy advisory body/panel ?	Yes There is a task force	Name of the body: we haven´t no name Link:
Does your country have a Bioeconomy agency or agencies ?	No	Name of the agency: Link:
Does your country have a Bioeconomy observatory collecting data/info ?	No	Name of the body: Link:
Does your country have a Bioeconomy National Contact point ?	No	Name: Contact:

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for down-load[46]
Agriculture	Yes	Until now, the strategy hasn´t been adopted	
Forestry	Yes	Until now, the strategy hasn´t been adopted	
Marine/Fisheries/Aquaculture	Yes	Until now, the strategy hasn´t been adopted	
Waste	Yes	Until now, the strategy hasn´t been adopted	
Agri-Food & Food security	Yes	Until now, the strategy hasn´t been adopted	
Food, Healthy diet	Yes	Until now, the strategy hasn´t been adopted	
Research & Innovation	Yes	Until now, the strategy hasn´t been adopted	
Green Growth Strategy	Yes / No	I haven´t enough information to answer this question	
Blue Growth Strategy	Yes / No	I haven´t enough information to answer this question	
Energy, including Bioenergy	Yes / No	I haven´t enough information to answer this question	
Industry, Enterprise	Yes / No	I haven´t enough information to answer this question	
Environment (incl. resource efficiency, sustainability, water use)	Yes / No	I haven´t enough information to answer this question	
Eco-System Services	Yes / No	I haven´t enough information to answer this question	
Regional development and Smart Spe-cialisation	Yes / No	I haven´t enough information to answer this question	
Education/Skills	Yes / No	I haven´t enough information to answer this question	
Other areas, please specify			

[46] Please provide English link (if available)

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[47]	**Link**[48]

[47] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[48] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	See below		
Forestry			
Marine/Fisheries/Aquaculture			
Waste as Biomass source			
Food/feed use of biomass (food/feed value chains)			
Energy use of biomass (bioenergy)			
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**			
Key Enabling Technology (Industrial Biotechnology)			
Communication, stakeholder involvement			
Other areas, please specify			

The State Plan for Scientific and Technological Research and Innovation stablish generic calls for research and innovation projects that are opened to every kind of proposal. There are four calls where the bioeconomy projects can be submitted:

- Call challenges-research:
    - Beneficiary: public research centre
    - Objectives: any project that face some challenge, trying to generate knowledge, can apply
    - 100% of expenses could be funded
    - Bioeconomy research projects usually represent around 20% (budget in 2014: 244.000.000 €)
- Call challenges-research in applied agrifood projects:
    - Beneficiary: public research centre belonging to the regional governments
    - Objectives: any project that face agrifood challenges, looking for solutions, can apply
    - 100% of the costs could be funded
    - Budget in 2014: 12.800.000 €
- Call challenges-collaboration:
    - Beneficiary: private company o private companies association
    - Objectives: any project that include a collaboration between a private company (looking for an innovation) and a public research centre (generating knowledge to be applied to this innovation) can ask for resources
    - Two different funding procedures: private investments are financed with public and subsidized loans are funded at 100% of the costs
    - Bioeconomy research projects usually represent near 10% (budget in 2014: 480.000.000 for subsidized loans and 60.000.000 € for funding the research activities carried out in public centres)
- Call innovation projects:
    - Beneficiary: private company
    - Objectives: Any projects that include innovation activities, which could or not incorporate research.
    - Investments are financed with public and subsidized loans

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

We don´t have success stories until now

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions			
Resource efficiency			
Renewable resources/ bio-based products			
Knowledge transfer and good practice and innovation			
Economic/ market framework			
Policy framework			
Healthy food research			
Bioenergy			
Animal feed			
Development of an agreed methodology for environmental footprints			
Biorefineries			
Food security			
Social inclusion			
Algae			
Genetics			
Other areas, please specify			

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

SCAR
Standing Committee on Agricultural Research

Strategic Working Group on Biomass

FI - FINLAND

Joint Survey on National Bioeconomy Strategies

Country:	**FINLAND**
Year of data collection:	2014
Contact mail person in charge of data collection:	elina.nikkola@mmm.fi

This survey consist of two parts. It is aimed to collect data on:

(19) National Bioeconomy Policies and

(20) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

Bioeconomy refers to an economy that relies on renewable natural resources toproduce food, energy, products and services. The bioeconomy strives to reduce our dependence on fossil natural resources, to prevent biodiversity loss and tocreate new economic growth and jobs in line with the principles of sustainable development.

The most important renewable resources in Finland are the biomass, or organic matter, in the forests, soil, fields, water bodies and the sea, and fresh water. Ecosystem services are the services offered by the environment, including binding carbon dioxide and opportunities for recreation. Another key aspect of the bioeconomy is not wasting natural resources but using and recycling them efficiently.

http://www.biotalous.fi/bioeconomy/

Please describe where your country's definition is different from the EU definition of the bioeconomy.[49]

The definition is basically the same.

[49] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribu-tion/implementation of the EU strategy on Bioe-conomy	5	**All answers below** are based on **The Finnish Bioeconomy Strategy** was published in June 2014 with the objectives to support the growth targets based on green economy, to prepare a proposal for the governmental decision and related work programme and to involve stakeholders and citizens. Bioeconomy based industries (forest industry) have been significant partner of the Finnish economy. For more information see http://www.biotalous.fi/bioeconomy Also other relevant strategies/programmes are mentioned if applicable.
Food security/ land-use competi-tion	4	The Finnish Bioeconomy Strategy Food Security in Developing countries can be enhanced through an interplay of policies. Food security pilot as a part of the implementation of Finland's Development Policy Programme (Ministry of Foreign Affairs), www.formin.finland.fi/en/developmentpolicy/publications Food for Tomorrow - Proposal for Finland's National Food Strategy. Government Report to Parliament 18 October 2010

		(http://www.mmm.fi/attachments/mmm/julkaisut/muutjulkaisut/5vTnoB8sh/Ruokastrategia_eng.pdf Rural Development Programme for Mainland Finland (2007-2013), also New programme for period 2014-2020 (approved by the Finnish Parliament, Commission hearing still ongoing) National spatial planning of acquaculture (only in Finnish)
Healthy diet	5	The Finnish Bioeconomy Strategy Food for Tomorrow - Proposal for Finland's National Food Strategy. Government Report to Parliament 18 October 2010 (http://www.mmm.fi/attachments/mmm/julkaisut/muutjulkaisut/5vTnoB8sh/Ruokastrategia_eng.pdf) Nutrition recommendations (http://www.ravitsemusneuvottelukunta.fi/portal/en/) Food quality chain (http://www.laatuketju.fi/laatuketju/www/en/index.php)
Independence from fossil re-sources/security of supply	4	The Finnish Bioeconomy Strategy Towards a Smart Resource Economy – Government Report to Parliament on Natural Resources 2010 (English summary on page http://www.tem.fi/ajankohtaista/julkaisut/julkaisujen_haku/alykas_ja_vastuullinen_luonnonvaratalous_valtioneuvoston_luonnonvaraselonteko_eduskunnalle.98249.xhtml update is ready in autumn 2014 Legislation on security of supply (http://www.nesa.fi/) National Energy and Climate Strategy Government Report to Parliament on 20 March 2013 (http://www.tem.fi/en/energy/energy_and_climate_strategy/strategy_2013 Exploitaion of forest residues as bioenerby source, long history in themochemical conversions from PDU to industrial scale
Development of classic bioecon-omy sectors (ag-	5	The Finnish Bioeconomy Strategy Rural Development Programme for Mainland Finland (2007-2013), also New programme for period 2014-2020 (approved by

riculture, forestry, fisheries, food, paper)		the Finnish Parliament, Commission hearing still ongoing) Forest industry is one of the largers export industries in Finland and strives for new busines sopportunities. Annual forest bio-mass production about 100 million m3. Finland's National Forest Programme 2015, http://www.mmm.fi/en/index/frontpage/forests/forest_policy/strategies_programmes/kmo2010.html Strategic Programme for the forest sector (covers also paper industry) https://www.tem.fi/en/current_issues/pending_projects/strategic_programmes_and_flagship_projects/strategic_programme_for_the_forest_sector European Maritime and Fisheries Fund, national programme (ready in autumn 2014) National Acquaculture Stratey (ready in autumn 2014)
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	5	The Finnish Bioeconomy Strategy Rural Development Programme for Mainland Finland (2007-2013), also New programme for period 2014-2020 (approved by the Finnish Parliament, Commission hearing still ongoing) National Energy and Climate Strategy Government Report to Parliament on 20 March 2013 (http://www.tem.fi/en/energy/energy_and_climate_strategy/strategy_2013 Cleantech Strategic Programme (http://www.tem.fi/en/current_issues/pending_projects/strategic_programmes_and_flagship_projects/strategic_programme_for_the_cleantech_business)
Maintaining business base and employment	5	The Finnish Bioeconomy Strategy Rural Development Programme for Mainland Finland (2007-2013), also New programme for period 2014-2020 (approved by the Finnish Parliament, Commission hearing still ongoing) The Innovative Cities Programme (INKA) (2014 – 2020) : http://www.tem.fi/en/innovations/strategic_centres_and_clusters/innovative_cities_programme_%28inka%29

		Industrial Competitiveness Approach – Means to guarantee economic growth in Finland in the 2010s: http://www.tem.fi/files/37744/TEMjul_9_2013_web_17102013.pdf
New business, increased employment	5	The Finnish Bioeconomy Strategy Rural Development Programme for Mainland Finland (2007-2013), also New programme for period 2014-2020 (approved by the Finnish Parliament, Commission hearing still ongoing) The Innovative Cities Programme (INKA) (2014 – 2020) : http://www.tem.fi/en/innovations/strategic_centres_and_clusters/innovative_cities_programme_%28inka%29 Industrial Competitiveness Approach – Means to guarantee economic growth in Finland in the 2010s: http://www.tem.fi/files/37744/TEMjul_9_2013_web_17102013.pdf Cleantech Strategic Programme (http://www.tem.fi/en/current_issues/pending_projects/strategic_programmes_and_flagship_projects/strategic_programme_for_the_cleantech_business)
Mitigation of climate change/adaptation to climate change	5	The Finnish Bioeconomy Strategy Finland's National Strategy for Adaptation to Climate Change **http://www.mmm.fi/en/index/frontpage/climate_change_energy/adaption.html** National Energy and Climate Strategy Government Report to Parliament on 20 March 2013 (http://www.tem.fi/en/energy/energy_and_climate_strategy/strategy_2013
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	5	The Finnish Bioeconomy Strategy Rural Development Programme for Mainland Finland (2007-2013), also New programme for period 2014-2020 (approved by the Finnish Parliament, Commission hearing still ongoing) The Forest Biodiversity Programme 2008-2016 (http://www.metsonpolku.fi/en/index.php)

		The national strategy and action plan for the conservation and sustainable use of biodiversity “Saving Nature for People” 2012. (http://www.ym.fi/en-US/Nature/Biodiversity/Strategy_and_action_plan_for_biodiversity)
Resource efficient economy (reduction of waste, use of residues)	5	The Finnish Bioeconomy Strategy National material efficiency programme – sustainable growth through material efficiency (http://www.tem.fi/files/38764/TEMjul_8_2014_web_27022014.pdf) Towards a Smart Resource Economy – Government Report to Parliament on Natural Resources 2010 (English summary on page http://www.tem.fi/ajankohtaista/julkaisut/julkaisujen_haku/alykas_ja_vastuullinen_luonnonvaratalous_valtioneuvoston_luonnonvaraselonteko_eduskunnalle.98249.xhtml update is ready in autumn 2014
Societal demand	5	The Finnish Bioeconomy Strategy
Other drivers – please specify	5	Economical crisis, structural changes in industry

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	Yes	Name of the strategy: **The Finnish Bioeconomy Strategy** Link: http://www.biotalous.fi/bioeconomy There are 125 ongoing programmes and strategies Finland, of which about 120 have direct link to bioeconomy some of which have been mentioned in Q2.
Ministry(ies) in charge of the Bioeconomy strategy ?	Yes	Name of the responsible Ministry/ Ministries: the Ministry of Employment and the Economy www.tem.fi Ministry of Agriculture and Forestry www.mmm.fi Ministry of the Environment www.ymparisto.fi
Does your country have a Bioeconomy advisory body/panel ?	No	Name of the body: Not yet, established this year
Does your country have a Bioeconomy agency or agencies ?	Yes	Name of the agency: No specific agency, governmental agencies handle also bioeconomy related issues as part of their normal duties.
Does your country have a Bioeconomy observatory collecting data/info ?	Yes	Name of the body: Statistics Finland http://www.stat.fi/index_en.html National Resources Institute Finland

		https://portal.mtt.fi/portal/page/portal/mtt/natural-resources-institute-finland
Does your country have a Bioeconomy National Contact point ?	Yes	the Ministry of Employment and the Economy Link: www.tem.fi Contact: Ms. Eeva-Liisa Kortekallio (eeva-liisa.kortekallio@tem.fi

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[50]
Agriculture	Yes	Rural Development Programme for Mainland Finland (2007-2013), also New programme for period 2014-2020 (approved by the Finnish Parliament, Commission hearing still ongoing)	
Forestry	Yes	The Strategic Programme for the Forest Sector (MSO) increases wood construction, the use of wood, exports in the sector, as well as new business activities in the bioeconomy sector.	http://www.tem.fi/en/current_issues/pending_projects/strategic_programmes_and_flagship_projects/strategic_programme_for_the_forest_sector
Marine/Fisheries/Aquaculture	Yes	National aquaculture strategy 2022, national spatial plan of aquaculture production, Operation programme for European maritime and fisheries fund 2014-2020 (will be approved in the end of 2014)	
Waste	Yes / No		
Agri-Food & Food security	Yes	Rural Development Programme for Mainland Finland (2007-2013), also New programme for period 2014-2020 (approved by the Finnish Parliament, Commission hearing still ongoing) Report on food safety 2013-2017 evaluates near future threts to food safety, presents objectives for food safety and proposes actions on how to achieve the objectives. Sustainable food production and consumption are integral part of food security. Areas covered include food waste reduction, quick response to environmental threats and preliminary analysis of novel technologies. Food for Tomorrow	http://www.eduskunta.fi/triphome/bin/thw/?${APPL}=akirjat&${BASE}=akirjat&${THWIDS}=0.56/1408535576_276832&${TRIPPIFE}=PDF.pdf

[50] Please provide English link (if available)

Food, Healthy diet	Yes	Food for Tomorrow - Proposal for Finland's National Food Strategy. Government Report to Parliament 18 October 2010 Report on food safety 2013-2017 assesses overweight being the biggest food safety issue on human health. The report lists 28 action points to tackle the nutrition related challenges. Execution of the actions relys on all stakeholders in the field to fork chain.	(http://www.mmm.fi/attachments/mmm/julkaisut/muutjulkaisut/5vTnoB8sh/Ruokastrategia_eng.pdf http://www.eduskunta.fi/triphome/bin/thw/?${APPL}=akirjat&${BASE}=akirjat&${THWIDS}=0.56/1408535576_276832&${TRIPPIFE}=PDF.pdf
Research & Innovation	Yes	During spring 2014, Academy of Finland together with Ministry of Agriculture and Forestry organised series of Foresight workshops, which focused on pinpointing the future needs of bioeconomy related research. These six workshops discussed on bioeconomy related paradigm change, new products, services and business concepts, as well as availability of raw materials and the role of ecosystem services in the future. The aim of this exercise is to create common understanding of the field (what has been done and what needs to be done), and to draw a roadmap of the future research needs.	No link available
Green Growth Strategy	Yes	The Finnish Bioeconomy Strategy The goal of the government's cleantech strategy is to accelerate growth in Finnish cleantech business and to renew the traditional industry through innovations in clean technology.The strategy is implemented by Cleantech Strategic Programme.	http://www.biotalous.fi/bioeconomy https://www.tem.fi/files/40668/Government_Strategy_to_Promote_Cleantech_Business_in_Finland.pdf
Blue Growth Strategy	Yes / No	Information not available	
Energy, including Bioenergy	Yes	Bioenergy and advanced biofuels are the main components in achieving the renewable energy targets in Finland. Climate and Energy Strategy has been	http://www.tem.fi/files/36292/Energia-

		updated in 2013. Key objectives of the strategy update included ensuring that the national targets for 2020 are achieved and to prepare a pathway towards meeting the long-term energy and climate objectives set by the EU.	_ja_ilmastostrategia_nettijulkaisu_ENGLANNINKIELINEN.pdf
Industry, Enterprise	Yes	Bioeconomy has been identified as one of the three growth areas of Finnish economy (Governments decision-in-principle on May 2014). In practice this means support and activities in ensuring competitiveness of the bioeconomy industries, support in new bioeconomy business and in bioeconomy education and R&D&I.	http://www.biotalous.fi/bioeconomy
Environment (incl. resource efficiency, sustainability, water use)	Yes		
Eco-System Services	Yes / No		
Regional development and Smart Specialisation	Yes	Rural Development Programme for Mainland Finland (2007-2013), also New programme for period 2014-2020 (approved by the Finnish Parliament, Commission hearing still ongoing)	
Education/Skills	Yes / No	We provide information later	
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[51]	**Link**[52]
Innovative cities Programme (INKA), Ministry of Bioeconomy, implementation responsibility: **Joensuu,** partners: Jyväskylä, Seinäjoki	Joensuu specializes in forest bioeconomy covering biomass supply and biomass products incl energy. Jyväskylä specializes in resource efficiency and added-value biobased products. Seinäjoki specializes in effcienct and sustaibale food systems.	
Biovalley Kalajokilaakso, Lestijokilaakso, and Perhonjokilaakso river valley areas as well as in the subregion areas of Kokkola and Pietarsaari in Western Finland	Biovalley regional bioeconomy development hub Biovalley is a region of strong expertise in the natural resource sector and bioeconomy in the. There are approximately 183.000 inhabitants, i.e. about 3 % of the country's population, but approximately 17% of the Finnish milk, 22 % of the Finnish food potatoes, 13 % of the Finnish wooden house production, 10 % of the Finnish pulp production and 9 % of the Finnish forest chips are produced here, among other things. Additionally, 46 % of the Finnish fur production farms are located in the region. The region lives strongly and diversely from the bioeconomy. In addition to agriculture and forestry, there is strong natural resource sector business activity in food industry, wood processing industry, building carpentry industry, bioenergy and in the manufacture of equipment, as well as in chemical industry. The diverse business activities are supported by research- and development organizations and educational organizations, which provide companies with the latest research information and skilled personnel	http://www.biolaakso.fi/frontpage

[51] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[52] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	N.A		
Forestry	E.g. FIBIC Finnish Bioeconomy Forum http://fibic.fi/		
Marine/Fisheries/Aquaculture	N.A.		
Waste as Biomass source	N.A.		
Food/feed use of biomass (food/feed value chains)	Lynet research programmes Lynet is A network of research institutes in the sectors of natural resources and environment in Finland – established by decree in 2009.	**Sustainable food system** • food security and self-sufficiency • Sustainable production and consumption • Risks and food safety	
Energy use of biomass (bioenergy)	**Tekes – the Finnish Funding Agency for Technology and Innovation** Green Growth programme 2011-2015	The aim of the Green Growth programme is to identify potential new growth areas for the sustainable economy business, which are essentially based on lower energy consumption and sustainable use of natural resources. The programme aims at a leap forward in energy and material efficiency of production and service chains over the entire life span of products. The programme is aimed for companies seeking to grow or renew their business in the face of chang-	http://www.tekes.fi/en/programmes-and-services/tekes-programmes/green-growth/

		es in energy and raw material prices and impacts of laws and regulations. The programme will support the generation of new innovations especially on boundaries between sectors, as future sustainable economy solutions will not be defined by traditional sectoral divisions. Research organisations will play an important role in generating new anticipatory information and skills.	
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	Finnish Bioeconomy Cluster – programmes: • Advanced Cellulose to Novel Products (Acel) • Future Biorefineries (FuBio) •	Finnish Bioeconomy Cluster FIBIC is one of six Strategic Centers for science, technology and innovation in Finland (SHOK). The aim of FIBIC is to turn science and technology into sustainable bio-based solutions. FIBIC combines research and companies for innovative solutions. We are accelerating Finland to become a pioneer in the sustainable bioeconomy. Research programs are the core FIBIC's activities. Our on-going research programs are related to the development of intelligent and resource-efficient processes, future biorefineries and bioenergy solutions.	
Key Enabling Technology (Industrial Biotechnology)	Academy of Finland programme on synthetic biology	The objective of the Academy of Finland's research programme on synthetic biology is to integrate Finnish-based researchers into an internationally competitive scientific community that would exceed a critical mass and that would actively work to develop synthetic biology and apply the research knowledge from the community. The research programme includes the following themes: • Modelling of biological structures and	

		metabolic routes • Building of biological modules into production systems • Process technology and health science applications • Biosecurity and ethics	
Communication, stakeholder involvement			
Other areas, please specify	Bioenergy • Forest Energy 2020 – programme (VTT/Metla) • BEST (Fibic/CLEEN)	ForestEnergy2020 is the five year (2012-2016) joint research and innovation programme at METLA (Finnish Forest Research Institute) and VTT (VTT Technical Research Centre of Finland). It covers the whole span of forest energy value chain from biomass production, supply chain to conversion plant and end use. Sustainable Bioenergy Solutions for Tomorrow (BEST) is a public-private research program launched in early 2013. BEST crosses traditional business area boundaries and joins the strengths of forest and energy sectors, complemented by the know-how of technology and consulting companies and research organizations. The program partners consist of 21 companies and 13 universities or research institutes. The planned duration is four years (2013-2016) with an annual budget of roughly 4 MEUR.	

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

Biomassa-atlas MTT Biomass Atlas – Accelerating sustainable usage of biomass in Finland

Knowledge of biomass supply, amount and location is needed in order to plan the usage of biomasses. More information is also needed on political decision making e.g. in energy and climate policy or food security. The biomass resources in Finland are well identified and registered. However the data is scattered and possibilities of spatial biomass data has not been fully utilized. In order to boost biomass usage, new kind of toolset is needed for supporting investment decisions, designing fuel strategy, procurement planning and certifying sustainability aspects. Biomass Atlas – a preliminary study sorts out existing data as well as brings out stakeholders preferences for this kind of service.
Decisions for actual realization of Biomass Atlas will be based on the preliminary study, which is conducted during year 2014.
Stakeholders' needs assessments and preferences, the outcome of data contents analysis, requirements specification of the system and roadmap for establishing Biomass Atlas will be the results of the preliminary project.
Biomass Atlas project is funded by Ministry of Forest and Agriculture of Finland. The project leader is MTT Agrifood research Finland. Other partners are The Finnish Forest Research Institute Metla, Finnish Environment Institute SYKE, Forestry Development Centre Tapio, University of Eastern Finland and University of Vaasa.

For further information, please contact
Eeva Lehtonen, project coordinator, Agrifood research Finland, eeva.lehtonen@mtt.fi; 029 531 7450
Birgitta Vainio-Mattila, Ministerial Adviser, Ministry of Agriculture and Forestry, birgitta.vainio-mattila@mmm.fi 029 516 2346

Vihreän kasvun malli MTT Green economy model for rural areas is a regional/local system that is based on decentralized solutions, and closed circles in energy and food production. It aims at increasing the self-sufficiency and general sustainability of the region. The green economy model functions within the ecological, social and economic boundaries of the region. The model will be applicable in different rural settings.

Fast pyrolysis industrial demonstration (Fortum, Metso, VTT) Fortum's new bio-oil plant has been commissioned in Joensuu, Finland. Producing bio-oil from wood-based raw materials, the plant is the first of its kind in the world on an industrial scale. Development and conceptualisation of the new technology has been done collaboratively between Fortum, Metso, UPM and VTT Technical Research Centre of Finland. The research has been part of TEKES – the Finnish Funding Agency for Technology and Innovation's Biorefine programme.

Novel production technology for bio-based materials (VTT): With foam forming technology, it is possible to manufacture different types of highly porous, lightweight and smooth products, such as hygiene products, insulators and filters. It may also be the solution for printed intelligence and electronics and microcellulose applications. The foundation for the development of this technology has been laid by Finlands Bioeconomy Cluster's programmes EffTech and EffNet

Stem cell technology used in skin care products (VTT) VTT has cooperated with LUMENE Oy to develop a cell culture technology that allows the stem cell extract derived from Finnish cloudberries to be used in skin care products. This technology is unique worldwide, and was developed exclusively for LUMENE Oy by VTT.

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions	5	Cooperation among JPI FACCE participants Cooperation in the context of Global Research Alliance on Agricultural Greenhouse Gases Nordic cooperation (SNS), IUFRO	Topical Calls addressing especially GHG emission issues Promotion of a closer link between JPI FACCE and GRA on AGG
Resource efficiency	3	EU FP7 Project FUSIONS 2012-2016 (FP7-KBBE-311972)	Strategies for Food waste prevention
Renewable resources/ bio-based products	5	Baltic Sea Region Interreg IVB project BalticMANURE 2011-2013 Nordic cooperation (SNS), IUFRO	
Knowledge transfer and good practice and innovation	4	IUFRO	
Economic/ market framework	3	EU FP7 Project Factor Markets 2010-2013 (FP7-KBBE-245123)	
Policy framework	3	IUFRO	
Healthy food research	4	EU FP7 Project NuAge 2011-2014 (FP7-KBBE-266486) EU FP7 Project OPTIFEL 2013-2016 (FP7-KBBE-311754)	Developing among European partners Safe and Healthy Food for an healthy ageing in Europe

		EU FP7 Project SmartAgriFood 2011-2013 (FP7-ICT-285326) SUSFOOD ERANET HDHL-JPI	
Bioenergy	3	EU FP7 Project VALORGAS 2010-2014 (FP7-ENERGY-241334) EERA (European Energy Research Alliance) Bioenergy IEA Bioenergy IUFRO	Maximise the potential for energy production from the anaerobic digestion of food waste as a second generation biofuel source
Animal feed	3	EU FP7 Project SOLID 2011-2016 (FP7-KBBE-266367)	Developing among European partners sustainable organic and low-input dairy production
Development of an agreed methodology for environmental footprints	3	EU FP6 Project AE-Footprint 2005-2008 (EU project code SSPE-CT-2005-006491) EU FP7 Project ENVIEVAL 2013-2015 (EU Grant Agreement No. 312071)	More organised cooperation among EU research projects which address environmental monitoring and evaluation issues
Biorefineries	4	EU FP6 Project TRACEBACK 2007-2010 (FP6-2005-FOOD-036300)	
Food security	4		
Social inclusion	3		
Algae	N.A.		
Genetics	3	Nordic cooperation (SNS, NordGen) IUFRO EU FP7 Project RUMINOMICS 2012-2016 (FP7-KBBE-289319) EU FP7 Project QUANTOMICS 2009-2012 (FP7-KBBE-222664)	

		**see list below	
Other areas, please specify		ERA-NET SYNBIO, several projects, Academy Syntheric biology programme developing new tools for bioeconomy	Important research topics would be: - Development and harmonization of advanced sustainability assessment approaches, methods and tools - Renewable biomaterials as raw material for added-value products; application of bioprocesses in manufacture - Conversion of biomasses originating from agro-food production into bio-based products Side- and remainder residues from agro-food production as raw material for biorefineries

* Examples of transnational cooperations are ERA-Nets, Joint-Programming-Initiatives, any bilateral or multilateral funding networks or research coordination platforms or similar.

**Genetics (MTT)
AnGR-NordicNET
ECPGR (European cooperative programme for plant genetic recources)
International Barley Genomics Sequencing Consortium
European Triticeae Genomics Initiative
BGN Barley Genome Network
EPSO (European plant science organization)
Interbull technical advisory committee
NAV scientific advisory committee
European Association of Animal Production's genetic commission
Clubware (genomicselection.net)

European Association of Animal Production's genetic commission
NJF Subsection Fur Animals, Committee for Genetics and Breeding
European Aquaculture Technology & Innovation platform, AquaInnova
COST Epigenetics
MTT-TEAGASC cooperation
MTT-AU (Denmark)-SLU (Sweden) cooperation in genomic selection research
Genomic reliability working group (France, the Netherlands, Germany, Finland, USA, New Zeeland)
Nordic feed efficiency project
NordGen
Cooperation in genetic evaluation program development (Austria, Ireland, UK, Germany)

- Development and harmonization of advanced sustainability assessment approaches, methods and tools (MTT)
- Renewable biomaterials as raw material for added-value products; application of bioprocesses in manufacture (MTT)
- Conversion of biomasses originating from agro-food production into bio-based products (MTT)
- Side- and remainder residues from agro-food production as raw material for biorefineries (MTT)

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JOINT RESEARCH CENTRE

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Strategic Working Group on Biomass

FR - FRANCE

Joint Survey on National Bioeconomy Strategies

Country: FRANCE

Year of data collection: 2014

Contact mail person in charge of data collection: cyril.kao@agriculture.gouv.fr

This survey consist of two parts. It is aimed to collect data on:

1. National Bioeconomy Policies and
2. National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

No official definition available yet.

Please describe where your country's definition is different from the EU definition of the bioeconomy.[53]

[53] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy		
Food security/ land-use competition		
Healthy diet		
Independence from fossil resources/security of supply		
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)		
Development of new bioeconomy sectors (bioenergy, industrial biobased products)		
Maintaining business base and employment		
New business, increased employment		
Mitigation of climate change/adaptation to climate change		
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)		
Resource efficient economy (reduction of waste, use of residues)		
Societal demand		
Other drivers – please specify	Ongoing reflection in France	

Does your country have a National Bioeconomy strategy ?	No	Name of the strategy: Link:
Ministry(ies) in charge of the Bioeconomy strategy ?	Yes / No	Name of the responsible Ministry/ Ministries: Link:
Does your country have a Bioeconomy advisory body/panel ?	No	Name of the body: Link:
Does your country have a Bioeconomy agency or agencies ?	No	Name of the agency: Link:
Does your country have a Bioeconomy observatory collecting data/info ?	Yes (partly)	Name of the body: National Observatory of Biomass Resources Link:
Does your country have a Bioeconomy National Contact point ?	No	Name: Contact:

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[54]
Agriculture	Yes	Agroecological project for France (2012), Legislation for the Future of Agriculture, Food and Forestry (2014)	
Forestry	Yes	Action plan for wood processing industries (2013), Wood industries plan (2014)	
Marine/Fisheries/Aquaculture	Yes / No		
Waste	Yes	Waste plan (2009-2012), Energy, methanisation and nitrogenous autonomy plan (2012)	
Agri-Food & Food security	Yes	National Food Plan (2010), Action plan against the rising price of grains (2012), National plan against food waste (2012)	
Food, Healthy diet	Yes	National Programme Nutrition and Health (2001), National Food Programme (2010)	
Research & Innovation	Yes	Programme “Investments for the Future” (2010), National Research Strategy (2014)	
Green Growth Strategy	Yes	Strategic industrial sectors of green economy (2010), Roadmap for the ecological transition (2012)	
Blue Growth Strategy	Yes / No		
Energy, including Bioenergy	Yes	Biofuels Plan (2004), Plan for Energetical Efficiency of Farms (2009), National Action Plan for Renewable Energies (2010), Energy, methanisation and nitrogenous autonomy plan (2012), Programmative Law for Energy Transition (planned, 2014)	
Industry, Enterprise	Yes	Strategy for Plant Chemistry and Biomaterials (2007), Strategy and action plan for the use of biobased materials in construction, 34 Industrial plans for sectors of the future (2013): especially The industrial plan « green chemistry and biofuels», World competition for innovation 2030 (2013): plant proteins, vegetal-based chemistry	
Environment (incl. resource efficiency, sustainability, water use)	Yes	Grenelle Environnement (2007), Biodiversity Legislation (planned, 2014)	
Eco-System Services	Yes	Grenelle Environnement (2007)	
Regional development and Smart Specialisation	Yes	Competitivness clusters policy (2004)	

[54] Please provide English link (if available)

Education/Skills	Yes	Teach to produce otherwise (2014)	
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)

Name	Description of the focus/specialisation[55]	Link[56]
Agri Sud-Ouest innovation	**1, 2 –** Agri-chains	http://www.agrisudouest.com/en/
Aquimer	**1, 2 –** Aquatic products	http://www.poleaquimer.com/en/index.html
Capenergies	**3 –** Energy generation with no greenhouse gases	http://www.capenergies.fr/fichiers/anglais/gbv5.pdf
Céréales Vallée	**1, 2, 4 –** Cereal Production, Food, Feed, and agromaterials from cereals	http://cereales-vallee.org/default_gb.cfm
Dream Eau et milieux	**3 –** Green technology related to water and aquatic environment	http://www.poledream.org/what-s-dream
Industries et Agro-Ressources	**2, 3, 4 –** Bioreffineries, plant-based chemistry, industrial biotechnologies	http://www.iar-pole.com/?lang=en
Nutrition, Santé, Longévité	**2 –** Innovative research in the fields of cardiovascular and metabolic diseases, age-related neurodegenerative diseases and nutrition	http://www.pole-nsl.org/index.php
PASS	**4** – Aroma, scents, flavors	
Pôle Fibres	**4 –** Wood and fiber materials	
Qualiméditerranée	**1, 2 –** Euro-mediterranean agriculture and food	http://www.qualimediterranee.fr/home.html
Qualitropic	**1, 2 –** Tropical bioeconomy	http://www.qualitropic.fr/uk/
Tenerrdis	**3 –** Energy, including wood energy, biogas, pretreatment and conversion processes	http://www.tenerrdis.com/
Terralia	**1, 2 –** Agro-food : fruits, vegetables, wine, cereals	http://www.pole-terralia.com/en/
Trimatec	**3 –** Industrial clean and sober processes, including aguae biomass	
Valorial	**2 –** Food for the future	http://www.pole-valorial.fr/spip.php?lang=en
Vegepolys	**1 –** Sustainable plant	http://www.vegepolys.eu/en/
Vitagora	**2 –** Taste, Nutrition, Health	http://www.vitagora.com/en
Xylofutur	**1, 4 –** Forest, wood, paper	

[55] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products

[56] Please provide English link (if available)

II Research & Development

Q 4: Which Bioeconomy related R&D programmes exist in your country ?

By type of activity	Programme name (please provide links)	Short description and relation with the Bioeconomy	National Public Funding allocated to the programme (€ / year)
Agriculture	PNDAR Investments for the Future ANR Challenge 5	Applied research for agriculture and rural development Crops improvement Food security, Biomass production and Agroecology	70 M€ 1 540 M€ (10 years) Annual Call
Forestry	ANR Challenge 1 and 5	Forest management and biodiversity, tree improvement	Annual Call
Marine/Fisheries/Aquaculture	ANR Challenge 1 and 5	Food security and environmental concerns	Annual Call
Waste as Biomass source	Investments for the Future ANR Challenge 1 Ademe DOSTE	Recycling and recovery of waste Sober resources management Organic waste, soil return, processing, energy	0,9 M€ (2015)
Food/feed use of biomass (food/feed value chains)	ANR Challenge 5	Optimization of food processing and waste reduction	Annual Call
Energy use of biomass (bioenergy)	Investments for the Future ANR Challenge 2 ADEME	Pilots for renewable and C-free energies Clean, safe and efficient energy Plant based chemistry and advanced biofuels	Annual Call
Industrial uses of biomass • **Paper and pulp production** • **Wood and products** • **Chemical production** • **Pharmaceutical production** • **Other industrial uses**	Investments for the Future ANR Challenge 3 ADEME, Program BIP ADEME BpiFrance DGCIS	Pilots for green chemistry Industrial renewal Bioressources, industries and Performance Plant based chemistry and advanced biofuels Structuring R&D projects for clusters Unique Interministerial Fund for collaborative projects	Annual Call
Key Enabling Technology (Industrial Biotechnology)	Investments for the Future Ademe ERA-IB	White Biotechnologies Industrial biotechnologies	20 M€ (10 years)
Communication, stakeholder involvement			
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

- **Cluster IAR** (Industries et Agro-Ressources)

RDI development structures in France especially for biobased chemistry and white biotechnology:

- **The biorefinery of Pomacle-**Bazancourt (Public support for innovation: FEDER (EU), FUI (Fr), local subs): includes a sugar and wheat refinery, an industrial ethanol plant 1G, a demo ethanol plant 2G (FUTUROL project), a demo plant for biobased chemistry: BIODEMO (ex of development: succinic acid of BioAmber and Biobased isobutene of Global Bioenergies). It includes a teaching and academic research center on biobased chemistry;
- **The IMPROVE shared innovative platform (PFMI**) with its sights set on becoming European leader in the commercialisation of plant-based protein for food and feed sectors and also in emerging sectors such as biosourced materials and cosmetics.

The BIOHUB project (leader: Roquette) is a major success in biobased chemistry. Polysorb, a 100% biobased isosorbide plasticizer has been put up on the market;

Operator ADEME**:**

The bio butterfly project on biobased butadiene demo plant (Michelin, Anxens, IFP En), ongoing action

The BIOMA project on biobased methacrylic acid demo plant (Global bioenergie, Arkema) ongoing action

The DEINOCHEM project on biobased isoprenoids demo plant (DEINOVE) ongoing action

The EuroBioref project (EU-FP7) on integrated biorefinery design for sustainable biomass processing (french partners: Arkema, Novance, CNRS)

The Biocore project (EU-FP7) on 2G biorefineries (french partners: case study on wheat/barely straw in center region)

The SUprabio project (EU FP7) on intensified unit operations that can be integrated into economic and sustainable 2G biorefineries (French partners: Algo sources Technologies sas)

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions			
Resource efficiency			
Renewable resources/ bio-based products			
Knowledge transfer and good practice and innovation			
Economic/ market framework			
Policy framework			
Healthy food research			
Bioenergy			
Animal feed			
Development of an agreed methodology for environmental footprints			
Biorefineries			
Food security			
Social inclusion			
Algae			
Genetics			
Other areas, please specify	Ongoing reflection in France		

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Strategic Working Group on Biomass

HU - HUNGARY

Joint Survey on National Bioeconomy Strategies

Country:	**HUNGARY**
Year of data collection:	2013
Contact mail person in charge of data collection:	Antal Ördögh

This survey consist of two parts. It is aimed to collect data on:

(21) National Bioeconomy Policies and

(22) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

No, we don't have our own definition of Bioeconomy. We follow the main definition of Bioeconomy by EU based on the definition of biotechnology by OECD.

Please describe where your country's definition is different from the EU definition of the bioeconomy.[57]

[57] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY

Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy

	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	4	
Food security/ land-use competition	3	
Healthy diet	3	
Independence from fossil resources/security of supply	2	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	3	
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	4	
Maintaining business base and employment	3	
New business, increased employment	2	
Mitigation of climate change/adaptation to climate change	1	
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	3	
Resource efficient economy (reduction of waste, use of residues)	4	
Societal demand	2	
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	Yes / No	Name of the strategy: Link:
Ministry(ies) in charge of the Bioeconomy strategy ?	Yes / No	Name of the responsible Ministry/ Ministries: Ministry of Agriculture, Ministry for National Economy Link: http://www.kormany.hu/en/ministry-of-agriculture; http://www.kormany.hu/en/ministry-for-national-economy
Does your country have a Bioeconomy advisory body/panel ?	Yes / No	Name of the body: different Committees of the Hungarian Academy of Sciences Link: http://mta.hu/articles/scientific-sections-105101
Does your country have a Bioeconomy agency or agencies ?	Yes / No	Name of the agency: National Innovation Office Link: http://www.nih.gov.hu/english
Does your country have a Bioeconomy observatory collecting data/info ?	Yes / No	Name of the body: Link:
Does your country have a Bioeconomy National Contact point ?	Yes / No	Name: Mrs. Ágnes Ratz Ludányi PhD. Contact: agnes.ludanyi@nih.gov.hu

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[58]
Agriculture	Yes / No	Regarding biotech in agriculture the New Fundamental Law of Hungary declares that usage and production of GM organisms and crops are banned/ connected to a permission.	http://www.kormany.hu/download/e/02/00000/The%20New%20Fundamental%20Law%20of%20Hungary.pdf
Forestry	Yes / No	TheNational Forest Programme aims at the increase in forest areas as well as the development of national forestry management	
Marine/Fisheries/Aquaculture	Yes / No		
Waste	Yes / No	Hungary has its first National Enviromental Technology Innovation Strategy. In this document there are layed down the basic development policies in different areas connecting to Enviromental Technologies.	http://kornyezettechnologia.kormany.hu/download/b/4f/50000/NETIS_English.pdf
Agri-Food & Food security	Yes / No	Hungary has its first National Enviromental Technology Innovation Strategy. In this document there are layed down the basic development policies in different areas connecting to Enviromental Technologies.	http://kornyezettechnologia.kormany.hu/download/b/4f/50000/NETIS_English.pdf
Food, Healthy diet	Yes / No	Hungary has its first National Enviromental Technology Innovation Strategy. In this document there are layed down the basic development policies in different areas connecting to Enviromental Technologies.	http://kornyezettechnologia.kormany.hu/download/b/4f/50000/NETIS_English.pdf
Research & Innovation	Yes / No	The New Széchenyi Plan is the overall development plan of the Hungarian Economy.	http://www.polgariszemle.hu/app/data/New_Szechenyi_Plan.pdf
Green Growth Strategy	Yes / No		
Blue Growth Strategy	Yes / No		
Energy, including Bioenergy	Yes / No	National Energy Strategy 2030	http://2010-2014.kormany.hu/download/7/d7/70000/Hungarian%20Energy%20Strategy%202030.pdf
Industry, Enterprise	Yes / No	The Hungarian Biotechnology Association published its Biotechnology Strategy in	http://www.google.hu/url?sa=t&rct=j&q=

[58] Please provide English link (if available)

		the framework of Biotechnology National Technology Platform. The Platfrom was led by the Association and the strategy documents were edited by well-known Hungarian biotech experts. The Strategy contains the strategy plan and recommendations for the development of the Hungarian Biotech Sector. It separately discusses the horizontal strategic plan and the plans of different strategic areas like red biotech, white and green biotechnology and bioinformatics.	&esrc=s&source=web&cd=1&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.nih.gov.hu%2Fdownload.php%3FdocID%3D23029&ei=zFwEVLyYEcjOygObm4GgCw&usg=AFQjCNER-pN5TxiM7Aa-ld5Vu1qo2RKmlw&bvm=bv.74115972,d.bGQ (HU)
Environment (incl. resource efficiency, sustainability, water use)	Yes / No	Hungary has its first National Enviromental Technology Innovation Strategy. In this document there are layed down the basic development policies in different areas connecting to Enviromental Technologies.	http://kornyezettechnologia.kormany.hu/download/b/4f/50000/NETIS_English.pdf
Eco-System Services	Yes / No	Hungary has its first National Enviromental Technology Innovation Strategy. In this document there are layed down the basic development policies in different areas connecting to Enviromental Technologies.	http://kornyezettechnologia.kormany.hu/download/b/4f/50000/NETIS_English.pdf
Regional development and Smart Specialisation	Yes / No	The Hungarian Biotechnology Association published its Biotechnology Strategy in the framework of Biotechnology National Technology Platform. The Platfrom was led by the Association and the strategy documents were edited by well-known Hungarian biotech experts. The Strategy contains the strategy plan and recommendations for the development of the Hungarian Biotech Sector. It separately discusses the horizontal strategic plan and the plans of different strategic areas like red biotech, white and green biotechnology and bioinformatics.	http://www.google.hu/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.nih.gov.hu%2Fdownload.php%3FdocID%3D23029&ei=zFwEVLyYEcjOygObm4GgCw&usg=AFQjCNER-pN5TxiM7Aa-ld5Vu1qo2RKmlw&bvm=bv.74115972,d.bGQ (HU)
Education/Skills	Yes / No	The Hungarian Biotechnology Association published its Biotechnology Strategy in the framework of Biotechnology National Technology Platform. The Platfrom was led by the Association and the strategy documents were edited by well-known Hungarian biotech experts. The Strategy contains the strategy plan and recommendations for the development of the Hungarian Biotech Sector. It separately discusses the horizontal strategic plan and the plans of different strategic areas like red biotech, white and green biotechnology and bioinformatics.	http://www.google.hu/url?sa=t&rct=j&q=&esrc=s&source=web&cd=1&ved=0CCQQFjAA&url=http%3A%2F%2Fwww.nih.gov.hu%2Fdownload.php%3FdocID%3D23029&ei=zFwEVLyYEcjOygObm4GgCw&usg=AFQjCNER-pN5TxiM7Aa-ld5Vu1qo2RKmlw&bvm=bv.74115972,d.bGQ (HU)
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[59]	**Link**[60]
ArchEnerg Cluster	**3**	**http://www.archenerg.eu/index.php/en/**
Pharmapolis Cluster	**2**	**http://www.pharmapiek.hu/index.php?hova=7**
PharmAgora Cluster	**2**	**http://pharmagoraklaszter.eu/teruletek.php**
South Great Plain Biomass Cluster	**3**	
National Biomass Cluster	**3**	
PANENERG Cluster	**3**	
Regional Bioenergy Cluster	**3**	

[59] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[60] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture			
Forestry			
Marine/Fisheries/Aquaculture			
Waste as Biomass source			
Food/feed use of biomass (food/feed value chains)			
Energy use of biomass (bioenergy)			
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**			
Key Enabling Technology (Industrial Biotechnology)			
Communication, stakeholder involvement			
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions			
Resource efficiency			
Renewable resources/ bio-based products			
Knowledge transfer and good practice and innovation			
Economic/ market framework			
Policy framework			
Healthy food research			
Bioenergy			
Animal feed			
Development of an agreed methodology for environmental footprints			
Biorefineries			
Food security			
Social inclusion			
Algae			
Genetics			
Other areas, please specify			

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Strategic Working Group on Biomass

IE - IRELAND

Joint Survey on National Bioeconomy Strategies

Country:	**Ireland**
Year of data collection:	2014
Contact mail person in charge of data collection:	dale.crammond@agriculture.gov.ie

This survey consist of two parts. It is aimed to collect data on:

(23) National Bioeconomy Policies and

(24) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

Ireland is supportive of the current EU bioeconomy definition although clearly has greater strengths and is more active in certain parts of it e.g marine and terrestrial food production and processing.

Please describe where your country's definition is different from the EU definition of the bioeconomy.[61]

[61] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	3	
Food security/ land-use competition	4	
Healthy diet	4	
Independence from fossil resources/security of supply	4	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	5	
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	3	
Maintaining business base and employment	5	
New business, increased employment	5	
Mitigation of climate change/adaptation to climate change	4	
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	3	
Resource efficient economy (reduction of waste, use of residues)	4	
Societal demand	3	
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	No	Name of the strategy: Ireland is only at the policy statement stage. There is a Green Growth Strategy which includes a commitment to develop a bioeconomy strategy Link: http://www.enterprise.gov.ie/publications/djei-publications/delivering_our_green_potential_pdf_589kb_.pdf
Ministry(ies) in charge of the Bioeconomy strategy ?		Name of the responsible Ministry/ Ministries: Ministry of Agriculture, Food and the Marine, Ministry of Jobs, Enterprise and Innovation, Ministry of Environment, Ministry of Communications, Energy and Natural Resources Link: www.agriculture.gov.ie, www.enterprise.gov.ie, www.environ.ie, http://www.dcenr.gov.ie/
Does your country have a Bioeconomy advisory body/panel ?	No	Name of the body: Not applicable Link:
Does your country have a Bioeconomy agency or agencies ?	No	Name of the agency: Not applicable Link:
Does your country have a Bioeconomy observatory collecting data/info ?	No	Name of the body: Not applicable Link:
Does your country have a Bioeconomy National Contact point ?	No	Name: Not applicable Contact:

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[62]
Agriculture	Yes	The agri-food sector has a dedicated development plan entitled Food Harvest 2020. It sets out a roadmap for growing the agri-food sector in the period to 2020. Therefore there is a strategy for the agriculture and food sectors, key components of Ireland's bioeconomy.	http://www.agriculture.gov.ie/media/migration/agri-foodindustry/foodharvest2020/2020FoodHarvestEng240810.pdf
Forestry	Yes	Forests, products and people- Ireland's forest policy- a renewed vision. Forestry is part of Ireland's bioeconomy.	http://www.agriculture.gov.ie/media/migration/forestry/forestpolicyreviewforestsproductsandpeople/00487%20orestry%20Review%20-%20web%2022.7.14.pdf

[62] Please provide English link (if available)

Marine/Fisheries/Aquaculture	Yes	These areas are included in Food Harvest 2020	http://www.agriculture.gov.ie/media/migration/agri-foodindustry/foodharvest2020/2020FoodHarvestEng240810.pdf
Waste	Yes	Waste Management Policy- reduced waste will provide feedstock opportunites for the bioeconomy	http://www.environ.ie/en/Environment/Waste/PublicationsDocuments/FileDownLoad,30729,en.pdf
Agri-Food & Food security	Yes	Food Harvest 2020	http://www.agriculture.gov.ie/media/migration/agri-foodindustry/foodharvest2020/2020FoodHarvestEng240810.pdf
Food, Healthy diet	Yes	Food Harvest 2020	http://www.agriculture.gov.ie/media/migration/agri-foodindustry/foodharvest2020/2020FoodHarvestEng240810.pdf
Research & Innovation	Yes	National Research Prioritisation Report	http://www.djei.ie/publications/science/2012/research_prioritisation.pdf
Green Growth Strategy	Yes	Delivering our Green Potential contains direction on green growth	http://www.enterprise.gov.ie/publications/djei-publications/delivering_our_green_potential_pdf_589kb_.pdf
Blue Growth Strategy	Yes	Elements of Blue Growth are addressed in Ireland's approach to implementing the EU Maritime Strategy for the Atlantic/ Atlantic Action Plan and contained within Ireland's Integrated Marine Plan "Harnessing our Ocean	http://www.ouroceanwealth.ie/SiteCollectionDocuments/Harnessing%20Our%20Ocean%20Wealth%20Report.pdf Sea Change (2007-2013) http://oar.marine.ie/bitstream/10793/69/1/Sea%20change%20part%20I.pdf National Marine Research & Innovation Strategy (2014-2020) *In Prep*.

		Wealth”	
Energy, including Bioenergy	Yes	National Bioenergy Strategy in preparation Elements of bioeconomy energy are contained within National Energy Action Plan	In prep. http://www.dcenr.gov.ie/NR/rdonlyres/20F27340-A720-492C-8340-6E3E4B7DE85D/0/DCENRNEEAP2014publishedversion.pdf
Industry, Enterprise	Yes	National Action Plans for Jops addresses issues around industry and enterprise	http://www.djei.ie/publications/2014APJ.pdf
Environment (incl. resource efficiency, sustainability, water use)	Yes	Our Sustainable Future- A framework for Sustainable Development addresses many issues including the sustainability of agriculture.	http://www.environ.ie/en/Environment/SustainableDevelopment/PublicationsDocuments/FileDownLoad,30452n.pdf
Eco-System Services	Yes / No	Not available	
Regional development and Smart Specialisation	Yes / No	Not available	
Education/Skills	Yes / No	No available	
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[63]	**Link**[64]
	N/A	

[63] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[64] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	**Research Stimulus Fund** operated by the Department of Agriculture, Food and the Marine http://www.agriculture.gov.ie/research/researchstimulusfundrsf/	All projects funded by this programme (agriculture production, environment and rural economics and development) are related to the bioeconomy.	Approx €6m/year
	Teagasc Annual Research Programme A programme which funds research projects and studentships in Teagasc – the Irish Agriculture and Food Development Authority. www.teagasc.ie	Topic areas include agriculture production, food processing, food for health, environment and rural economics and development are related to the Bieconomy	Approx €35m-€40m/year
Forestry	The Department's **Programme of Competitive Forest Research for Development (CoFoRD)** funds forestry research in all public research performing organisations. http://www.agriculture.gov.ie/research/programmeofcompetitiveforestryresearchfordevelopmentcoford/	Forestry is part of Ireland's Bioeconomy.	Approx €3m/year
Marine/Fisheries/Aquaculture	Marine Institute Research Programme A programme of core grant in aid programme focusing on areas of Marine research www.marine.ie	The Marine sector is a key component of Ireland's bioeconomy	Approx €8m per year

	Food Institutional Research Measure (FIRM) operated by the Deparment of Agriculture, Food and the Marine	The FIRM programmes funds aquaculture and marine research on a competitive basis. It also funds food processing research, food for health research which is all part of Ireland's bioeconomy.	Approx €9m per year
Waste as Biomass source	N/A		
Food/feed use of biomass (food/feed value chains)	N/A		
Energy use of biomass (bioenergy)	**Energy Research, Development & Demonstration (RD&D) Programme** http://www.seai.ie/Grants/Renewable_Energy_RD_D/	Bioenergy research can be funded under this programme	Not available
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	**NIBRT** research is based on a foundation of scientific excellence and is focused on delivering practical solutions to the biopharma industry http://www.nibrt.ie/research **Bioenergy and Biorefinering Competence Centre-** - innovation for a sustainable and competitive biobased economy	The biopharma sector is part of the European bioeconomy The bioenergy and Biorefinering Competence Centre is funded by Enterprise Ireland and IDA and seeks to link researchers and industry in the areas of bioenergy and biorefining. It is not a funding programme per say.	Not available
Key Enabling Technology (Industrial Biotechnology)	SFI Centres for Science, Engineering & Technology (CSETs) and Strategic Research Clusters (SRCs) has funds biotech research www.sfi.ie	Biotechnology projects have been funded by SFI	Not available

Communication, stakeholder involvement	DAFM provide secretariat to industry led National Expert Advisory Group on Agri-Food Research & Innovation.	This group provides advice to the Department on agri-food research priorities both nationally and at a European level	
Other areas, please specify			
FOOD	**Food Institutional Research Measure (FIRM)** operated by the Deparment of Agriculture, Food and the Marine http://www.agriculture.gov.ie/research/foodinstitutionalresearchmeasurefirm/	The FIRM programmes funds aquaculture and marine research on a competitive basis. It also funds food processing research, food for health research which is all part of Ireland's bioeconomy.	Approx €9m per year

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

An example of a Bioeconomy related success story from Ireland is a company called Biomass Heating Solutions www.bhsl.ie. They developed a number of poultry litter combusters using fluidised bed combustion technology. The burning of the litter creates energy to provide a sustainable source of heat for the poultry housing on farm. BHSL has recently started to sell their units overseas. Funding provided by the Department's Stimulus programme to the University of Limerick would have contributed in some part to helping the company achieve the success it has to date.

A biodiesel plant is in operation and produces 30,000 tonnes of high quality biodiesel from recovered vegetable oil and tallow feedstocks. The development of this plant was on the back of research funded by Teagasc into tallow feedstocks. The plant employs 22 people. Biodiesel produced by the plant was initially exported to the United Kingdom but domestic sales have grown strongly since the introduction of the biofuels obligation mandate, part of the 2010 Energy Act, which requires oil companies in Ireland to blend 4% biofuels into their products. Thus biodiesel from the plant at New Ross is available at forecourts around Ireland as a blend with mineral diesel.

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions	5	Yes, FACCE JPI Global Research Alliance on Agricultural Greenhouse Gases.	
Resource efficiency	4	ICT-AGRI ERANET c-IPM ERANET SCAR CWG Sustainable Animal Production	
Renewable resources/ bio-based products	4		
Knowledge transfer and good practice and innovation	5	SCAR CWG AKIS European Innovation Partnership on Agricultural Productivity and Sustainability	
Economic/ market framework	3		
Policy framework		SCAR SWG Agricultural Research fro Development	
Healthy food research	5	HDHL JPI	
Bioenergy	3	ERA-Net Bioenergy	
Animal feed	4		
Development of an agreed methodology for environmental footprints	5	Work ongoing with an FAO initiative LEAP - **Livestock Environmental Assessment and Performance**	
Biorefineries	4	ERA-Net on Integrated Biorefineries	
Food security	5	Belmont Forum/FACCE-JPI Joint Collaborative Research Action on “Food Security and Land Use Change” FACCE ERANET+	
Social inclusion	3		
Algae	3		

Genetics	4	Will be addressed as part of Sustainable Livestock Production SCAR CWG	
Other areas, please specify			

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

SCAR
Standing Committee on Agricultural Research

Strategic Working Group on Biomass

IL - ISRAEL

Joint Survey on National Bioeconomy Strategies

Country:	
Year of data collection:	2013
Contact mail person in charge of data collection:	Yuval ESHDAT

This survey consists of two parts. It is aimed to collect data on:

(25) National Bioeconomy Policies and

(26) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

NO. MOARD (the **M**inistry **o**f **A**griculture and **R**ural **D**evelopment) accept the EU definition regarding this survey

Please describe where your country's definition is different from the EU definition of the bioeconomy.[65]

[65] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY

Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy

	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	2	
Food security/ land-use competition	5	
Healthy diet	5	
Independence from fossil resources/security of supply	3	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	4	Forestry and related paper issues are limited in Israel semi-arid zone
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	4	
Maintaining business base and employment	4	
New business, increased employment	5	
Mitigation of climate change/adaptation to climate change	4	Mainly adaptation, to lesser extent mitigation
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	5	
Resource efficient economy (reduction of waste, use of residues)	4	Mainly reusable (recycled) water
Societal demand	3	

Other drivers – please specify	Food safety, efficient water use (limitation of rainfall), need for efficient transportation of fresh agricultural products, Top hightech industry (ICT), advances biotechnology

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	~~Yes /~~ No	Name of the strategy: Link:
Ministry(ies) in charge of the Bioeconomy strategy ?	~~Yes /~~ No	Name of the responsible Ministry/ Ministries: several Ministries with their own strategy with attempts to collaborate: Ministry of Economics, Ministry of Agriculture and Rural Development, Ministry of Infrastructure and Energy, Ministry of Health, Ministry of Environment. Link:
Does your country have a Bioeconomy advisory body/panel ?	~~Yes~~ / No	Name of the body: Link:
Does your country have a Bioeconomy agency or agencies ?	~~Yes~~ / No	Name of the agency: Link:
Does your country have a Bioeconomy observatory collecting data/info ?	~~Yes~~ / No	Name of the body: Link:
Does your country have a Bioeconomy National Contact point ?	~~Yes~~ / No	Name: Contact:

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[66]
Agriculture	Yes / ~~No~~	It is included in MOARD objectives and its implementation by the Extension service and MOARD regulatory acts.	In Hebrew only (for all sectors below)
Forestry	~~Yes /~~ No		
Marine/Fisheries/Aquaculture	Yes ~~/ No~~	It is included in MOARD objectives and its implementation by the Extension service and MOARD regulatory acts.	
Waste	Yes ~~/ No~~	Bioeconomy of agricultural waste is included in MOARD objectives and its implementation by the Extension service and MOARD regulatory acts.	
Agri-Food & Food security	Yes ~~/ No~~	It is included in MOARD objectives and its implementation by the Extension service and MOARD regulatory acts.	
Food, Healthy diet	~~Yes /~~ No		
Research & Innovation	Yes ~~/ No~~	**Bioeconomy related subjects are included in MOARD Chief Scientist R&D Fund, including international cooperation.**	
Green Growth Strategy	~~Yes /~~ No		
Blue Growth Strategy	~~Yes /~~ No		
Energy, including Bioenergy	~~Yes /~~ No		
Industry, Enterprise	~~Yes /~~ No		
Environment (incl. resource efficiency, sustainability, water use)	Yes ~~/ No~~	It is included in MOARD objectives and its implementation by the Extension service and MOARD regulatory acts.	
Eco-System Services	~~Yes /~~ No		
Regional development and Smart Specialisation	Yes ~~/ No~~	It is included in MOARD objectives and its implementation by the Extension service and MOARD regulatory acts.	

[66] Please provide English link (if available)

Education/Skills	~~Yes /~~ No		
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[67]	**Link**[68]

[67] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[68] Please provide English link (if available)

II Research & Development

Q 4: Which Bioeconomy related R&D programmes exist in your country ?

By type of activity	Programme name (please provide links)	Short description and relation with the Bioeconomy	National PublicFunding allocated to the programme (€ / year)
Agriculture	MOARD Chief Scientist Fund	Includes many aspects of bioeconomy embedded in the different objectives of the fund	About 25M for the whole program. Bioeconomy related subjects comprises a significant part of the projects (not possible to estimate exactly)
Forestry	KKL Research Action	Green spaces	
Marine/Fisheries/Aquaculture			
Waste as Biomass source			
Food/feed use of biomass (food/feed value chains)			
Energy use of biomass (bioenergy)	An objective within MOARD Chief Scientist Fund	Utilization of biomass & agri-waste for energy	
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**			
Key Enabling Technology (Industrial Biotechnology)	**Industrial Biotechnology**	Enzymes and microorganisms for biotechnological use	
Communication, stakeholder involvement			

Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

Recycling of sewage water for irrigation and compost production

Conversion of agri-waste into energy and useful products for sustainable agro-technology and environment.

In the broader term of Bioeconomy, sustainable agriculture of improved and new varieties of fruits, vegetables and cultured fish in-land, provides valorised and healthier food and contributes to employment and environment as well.

Improved cultivated Bio-Fuel plants

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperation established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions	3	FACCE-JPI	
Resource efficiency	4	Water technology, especially recycled	
Renewable resources/ bio-based products	2	ERA-IB	
Knowledge transfer and good practice and innovation	4	Throught variouse COST programs, ERA-NET programs	
Economic/ market framework			
Policy framework	4	Involvement in SCAR & Horizon 2020 programs	
Healthy food research			
Bioenergy			
Animal feed			
Development of an agreed methodology for environmental footprints			
Biorefineries			
Food security	4	FACCE-JPI	
Social inclusion			
Algae			
Genetics	5	REA-PG, ERA-CAPS	
Other areas, please specify	5	ERA-ICT, ARIMNet	

IT - ITALY

Refining Questionnaire on national bioeconomy strategies

Please return to:

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During January/February 2013, a first questionnaire round was performed to find aout about:

- Existing national bioeconomy strategies
- National bioeconomy strategies in preparation
- The drivers that led/lead to the development of a strategy and the scope/target of the strategy
- National research programmes, funds ddedicated to bioeconomy relevant research programmes and existing european R&D cooperations
- Possibilities/needs for European R&D cooperation

We received responses from 12 members of the SWG. Those responses lead to some interesting starting assumptions but also lead to more questions.

Therefore, with this template we would like to achieve two goals:

1.) Receive answers from more countries
2.) Receive a deeper insight into the national understanding of a bioeconomy and the measures to implement a corresponding strategy

Q 1: **What are/ what would be the main drivers for your country to engage in the development of the Bioeconomy?**		
	Please insert a priority from 5=high to 1=low	**Comment/specification, Reference to policy document (in English if available)**
Independence from fossil resources/security of supply	5	National plan for renewable energy sources http://www.sviluppoeconomico.gov.it/index.php?option=com_content&view=article&idmenu=454&idarea1=572&andor=AND&idarea2=0&sectionid=4,7&andorcat=OR&showMenu=1&showCat=1&idarea3=0&idarea4=0&partebassaType=0&idareaCalendario1=0&MvediT=1&showArchiveNewsBotton=0&directionidUser=0&page=3&id=2016335&viewType=0
New business, increased employment	4	
Maintaining business base and employment	5	
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	5	
Resource efficient economy (reduction of waste, use of residues)	5	
Contribution/implementation of the EU strategy on bioeconomy	3	
Mitigation of climate change/adaptation to climate change	4	
Food security/ land-use competition	3	
Healthy diet	4	
Societal demand	3	
Other drivers – please specify		

	Q 2: **National strategies which would also cover the bioeconomy at least partly**			
Bioeconomy[69] related strategies	**Is a policy strategy for that area/sector available? Please answer "yes" or "no"**	**Is a R&D strategy for that area/sector available? Please answer "yes" or "no"**	**If yes please elaborate on how the bioeconomy is covered in the strategy**	**Link for download (in English if available)**
Green Growth Strategy	Under setting (expected end 2013)	Under setting (expected end 2013)		http://www.statesgeneral.org/
Agriculture				
Agri-Food, Food security	yes	yes	Sustainable food productions and valorization of local products know-out	Refers to food for life Strategic agenda http://www.federalimentare.it/Attivita/ETP-Italia/7luglio2006/All%201%20ITALIAN%20%20TECHNOLOGY%20PLATFORM.pdf; and:agri-food cluster http://www.federalimentare.it/m_comunicati_det.asp?ID=691
Food, Healthy diet	yes	yes	Improve health, well being and aging with sustainable food products and their components in balanced diets	Refers to food for life Strategic agenda http://www.federalimentare.it/Attivita/ETP-Italia/Documenti/AgendaStrategica.pdf; and JPI HDHL vision and SRA https://www.healthydietforhealthylife.eu/images/documents/jpi_sra.pdf
Social welfare	yes	yes	sustainable rural development and innovation for young entrepreneurs,	http://www.reterurale.it/flex/cm/pages/ServeBLOB.php/L/EN/IDPagina/2489
Industry	yes	yes	green chemistry cluster; PPP and biorefineries development	Italian cluster on Green Chemistry, www.chimicaverde.eu
Resources, resource ef-				

[69] Definition of Bioeconomy according to the Commission Staff Working Document of COM(2012) 60 final Innovation for Sustainable Growth. A Bioeconomy for Europe: The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products1 and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge.

ficiency				
Others, please speci-fy				

Q 3: **What is your countries definition of a bioeconomy?**
In addition to the definition, please make a reference to an official document or webpage of an official body such as ministries or a national bioeconomy council or similar.
In Italy more than bioeconomy it has been adopted the wording "green economy" according to the official version that state: The **green economy** is one that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. Green economy is an economy or economic development model based on sustainable development and a knowledge of ecological economics. A feature distinguishing it from prior economic regimes is the direct valuation of natural capital and ecological services as having economic value and a full cost accounting regime in which costs externalized onto society via ecosystems are reliably traced back to, and accounted for as liabilities of, the entity that does the harm or neglects an asset http://www.politicheagricole.it/flex/cm/pages/ServeBLOB.php/L/IT/IDPagina/1728 (downloadable press release by former Ministry Giancarlo Galan about green economy in Italy)
Please describe where your countries definition is different from the EU definition of the bioeconomy. Definition of Bioeconomy according to the Commission Staff Working Document of COM(2012) 60 final Innovation for Sustainable Growth. A Bioeconomy for Europe: The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge.
There are no relevant differences between the definition of the Italian green economy strategy and the EU definition, because both of them encompass the same sectors and fields. It is just a matter of words. The word "bio" in ancient greek roots means "life" and in Italian "life economy" is not that appealing, so, considering that it has been chosen the word "green" in order to encompass the environmental and agricultural aspects involved in a sustainable growth as foreseen in the EU bioeconomy definition

Q 4: Which bioeconomy related R&D programmes exist in your country?			
Name of Programme	**Short Description of the full scope of the Programme**	**Short description of the relation the bio-economy**	**Funding available within the Pro-gramme €/ year**

Italy has not specific “Bioeconomy” related R&D programmes, however during the last 4 years up to now, it has funded several R&D projects (some of them involving also SMEs) in compliance with the bioeconomy strategy. (See list attached).

Q 5: **Potential benefit of European Research cooperation**			
	Is there a benefit of European cooperation? Please answer "yes" or "no"	**Are there any transnational cooperations* already established between you and other European Member States? If yes please specifiy.**	**If you identified a benefit of cooperation, please indicate which instruments could be used beyond those in place, if any.**
			Integration of the instruments already used in all the below actions with researcher mobility programs and infrasctructures sharing
Common sustainability criteria/ GHG emmissions	yes	**GRA - The Global Research Alliance on Agricultural Greenhouse Gases** was launched in December 2009 and now has 37 member countries from all regions of the world. The Alliance is focused on research, development and extension of technologies and practices that will help deliver ways to grow more food (and more climate-resilient food systems) without increasing greenhouse gases emissions. **ERA-Net CIRCLE 2** Research funding network on Climate Change Impacts, Vulnerability and Adaptation (CCIVA) policy-relevant questions. Objectives: facilitate cooperation among Europe's national and regional CCIVA research programmes sharing knowledge; promote a common strategic agenda on relevant CCIVA research areas and coordinate it with European framework programmes, policies and objectives; design and fund joint initiatives and joint calls for transnational CCIVA research;	http://www.globalresearchalliance.org/research/ action plans of 3 focus research area different http://www.circle-era.eu climate research adaptation agenda (downloadable) http://www.circle-era.eu/np4/CARA
Resource efficiency			
Renewable resources/ bio-based products		**WOOD WISDOMnet** **ERANET on** "Networking and Integration of National Programmes in the Area of Wood Material Science and Engineering in the Forest-Based Value Chains"to promote the transformation of the European F-BI from a resource-intensive to a value-added knowledge-intensive, innovative and globally competitive industry based on the sustainable use of renewable raw materials.	http://www.woodwisdom.net /
Knowledge	yes	The **CWG AKIS** has already tackle this	

transfer and good practice and innovation		issue and most of the related documents are available on the CIRCA website	
Economic/ market framework			
Policy framework			
Healthy food research	yes	**JPI – HDHL "A healthy diet for a healthy life**" Dealing with the relationships among food production, human nutrition and the incidence of diet-related diseases, to better understand the factors that determine food choices and physical activity behaviours, and thus human health. This knowledge will be translated into programmes, products, tools and services to promote healthy food consumptions. The strategic research agenda is focused on determinant of diet and physical activity influencing consumer choices, diet and food productions and diet related chronic diseases.	http://www.healthydietforhealthylife.eu/
Bioenergy			
Animal feed	Yes	**CWG "Sustainable Animal Production"**	
Development of an agreed methodology for environmental footprints	yes	**ERANET SUSFOOD** **Joint transnational projects in the frame**	https://www.susfood-era.net/
Biorefineries	Yes	**CWG "Biorefineries"**	
Food security	yes	**JPI – FACCE "Agriculture, food security and climate change"** Agriculture, food security and climate change pose key challenges for the world;. all countries need to build more resilient food systems in the light of expected (and unexpected) changes ahead. Research can play a leading role in bringing solutions to develop knowledge and technologies for underpinning sustainable and competitive food production systems. The Strategic Research Agenda of FACCE sets out the strategic priorities for trans-disciplinary and innovative European research on Agriculture, Food Security and Climate Change on 5 core themes: (i) Sustainable food security under climate change, (ii) Environmentally sustainable growth and intensification of agriculture, (iii) Trade-offs between food supply, biodiversity and ecosystem services, (iv) Adaptation to Climate Change,	http://www.faccejpi.com/

		and (v) Mitigation of Climate Change. It also provides a framework for the alignment of existing programmes and joint research efforts to achieve the twin objectives of food security and climate change adaptation. **ERA-Net "SUSFOOD" – Sustainable food production and consumption** The strategic goal of SUSFOOD is to reinforce the scientific cooperation between EU member and associated states in order to maximise the contribution of research to the development of food systems aiming at more sustainability from production to consumption.	https://www.susfood-era.net/
Social inclusion	yes	**ERA- Net "RURAGRI** The reorientation of agriculture towards improved ecological practices, the economic viability of rural areas and their contribution to sustainable development set new issues for policy making as well as research. RURAGRI explores emerging topics for agricultural research integrated with research on other land use sectors to fully cover territorial processes and rural areas in their environmental, social and economic interactions. Europe.	https://www.ruragri-era.net
Algae			
Genetics	yes	**ERA-CAPS** **Sustainable collaboration in plant sciences through coordinating and funding excellent transnational research.** The main objective is to develop a common agenda and shared vision for plant science research across the European Research Area and create a joint research programme. It is the continuation of : **ERA-Net PLANT GENOMICS** ERA-PG had the ambition to further structure the plant genomics scientific and technological programmes in Europe coordinating national/regional plant genomics research programmes and lunching joint projects. **ETB – European Programme for Transnational R&D%I cooperation of Biotech SMEs** EuroTransBio (ETB) is an international funding initiative supported by European program owners. It has established itself	http://www.eracaps.org http://www.erapg.org www.eurotransbio.eu

		as the preferred funding instrument for small and medium sized enterprises (SMEs), collaborating in the area of modern biotechnology. The mission of ETB is to foster the competitiveness of the European biotechnology industry by supporting research intensive SMEs and their strategic partner with the aim of achieving a thriving European biotechnology industry.	
Other areas, please specify ICT	Yes	**ERA-Net ICT-AGRI "Coordination of ICT and Robotics in Agriculture and Related Environmental Issues"** The overall goal of ICT-AGRI is to strengthen the European research in the area developing a common European research agenda on ICT and robotics in agriculture, and to promote joint initiatives to network all the stakeholders involved in the development of new technologies for a competitive, sustainable and environmentally friendly agriculture.	http://db-ictagri.eu/ict-agri/content/home.php Strategic Research Agenda (downloadable) http://db-ictagri.eu/ict-agri/content/SRA.php

* Examples of transnational cooperations are ERA-Nets, Joint-Programming-Initiatives, any bilateral or multilateral funding networks or research coordination platforms or similar.

LV - LATVIA

Joint Survey on National Bioeconomy Strategies

Country: Latvia

Year of data collection:	2014
Contact mail person in charge of data collection:	Laura.Liepina@zm.gov.lv

This survey consist of two parts. It is aimed to collect data on:
(27) National Bioeconomy Policies and
(28) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

Latvia does not have a national definition for bioeconomy but mostly the following one is being used: Bioeconomy is an economy where production and industry of food, feed and energy is based on the Earth's and maritime biological resources, including waste. It also encompasses bioprocesses used in a sustainable production.

In comparison to the EU definition, focus on renewable materials and resources is missing, therefore the definition does not give an idea of bioeconomy as an industry based on renewable techniques and reuse.

Please describe where your country's definition is different from the EU definition of the bioeconomy.[70]

[70] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY

Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy

	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	5	Common EU policy (including common goals and intergovernmental cooperation) is needed for more succesfull results in each of the member states
Food security/ land-use competition	3	Food safety becomes an integral part of people's everyday life. Sustainable agriculture is a milestone for conservation of ecosystems and mitigation of climate change
Healthy diet	4	Organic farming practices. Wholesome, balanced and heathy food is crucial for society development
Independence from fossil resources/security of supply	5	Latvia is highly dependent on Russia's fossil resources (mainly natural gas) therefore taking into account the recent tension between EU and Russia it is very important to gain more independence in energy sector and to develop national energy production.
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	4	Classic sectors need improvements (more effective agricultural land use, more sustainable fishery systems, development of forests of high economic value, ensuring full food processing cycle etc.)
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	4	Development of bioenergy industry is required for Latvia to become more independent in energy sector and to foster the reuse of agricultural and forestry residues.
Maintaining business base and employment	5	Pasive or even decreasing economic activity will lead to the loss of work places that are crucial for people survival.
New business, increased employment	5	In order to raise the economic and social welfare, more high technology businesses and ways of production are needed. Such development gives the added value to the work of each individual and the state in total.

Mitigation of climate change/adaptation to climate change	4	Transport and energy sectors encompass the greatest potential of reducing GHG emissions. It is closely linked to bioeconomy because it can be achieved by the development of bioenergy. Though the rise of average temperature is likely to improve the agricultural production, Latvia still will be forced to modify many sectors in order to prevent the negative impacts that are going to affect agriculture, forestry, urban territories etc. Climate change poses significant weather fluctuations, which makes difficult to control diseases and pests, to maintain biological diversity.
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	4	Being the world's second greenest country (source: EPI, 2013), Latvia is willing to preserve its' natural richness, for that reason only such economic development is preferable that complies with the sustainability principles.
Resource efficient economy (reduction of waste, use of residues)	5	Most of the waste is being deposited in Latvia because the waste recycling system is very low developed. What applies to the use of residues in agriculture and forestry, the situation is better but it still has a huge potential in the energy production.
Societal demand	3	Society need safety in all its forms, it means independence on imported energy, food security, clean environment etc.
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	No	Name of the strategy: Link:
Ministry(ies) in charge of the Bioeconomy strategy ?	Yes	Name of the responsible Ministry/ Ministries: Ministry of Agriculture Link: http://www.zm.gov.lv/
Does your country have a Bioeconomy advisory body/panel ?	No	Name of the body: Link:
Does your country have a Bioeconomy agency or agencies ?	No	Name of the agency: Link:
Does your country have a Bioeconomy observatory collecting data/info ?	Yes	Name of the body: Environment, Bioenergetics and Biotechnology competence centre Link: http://www.vbbkc.lv/?par-mums
Does your country have a Bioeconomy National Contact point ?	No	Name: Contact:

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[71]
Agriculture	Yes	Use of biowaste in biogas production (Sustainable Development Strategy of Latvia until 2030)	http://www.pkc.gov.lv/images/LV2030/LIAS_2030_en.pdf
Forestry	Yes	As a potential flagship project ''Sustainable Forest Management in the Baltic Sea Region – EFINORD'' is noted	http://www.balticsea-region-strategy.eu/component/edocman/eusbsr-action-plan
Marine/Fisheries/Aquaculture	Yes / No		
Waste	Yes	Action Plan of the EU Baltic Sea Region Strategy calls for improved manure utilisation and efficiency	http://www.balticsea-region-strategy.eu/component/edocman/eusbsr-action-plan
Agri-Food & Food security	Yes / No		
Food, Healthy diet	Yes	Knowledge-based health and bioeconomy leading to high added-value jobs based on a shared and bottom-up developed strategy	http://www.balticsea-region-strategy.eu/component/edocman/eusbsr-action-plan
Research & Innovation	Yes	Environment, Bioenergy and Biotechnology Competence centre aims to increase competitiveness of businesses by facilitating cooperation of research and industry sectors in implementation of projects for industrial research, development of new products and technologies; Action Plan of the EU Baltic Sea Region Strategy calls for exploiting full potential	http://www.vbbkc.lv/?par-mums http://www.balticsea-region-strategy.eu/component/edocman/eusbsr-action-plan

[71] Please provide English link (if available)

		in research and innovation for marine energy and blue biotechnology	
Green Growth Strategy	Yes	The Baltic Sea Region Strategy gives a comprehensive look at several bioeconomy issues	http://www.balticsea-region-strategy.eu/component/edocman/eusbsr-action-plan
Blue Growth Strategy	Yes / No		
Energy, including Bioenergy	Yes	Action Plan of the EU Baltic Sea Region Strategy calls for the development of the usage of sustainable biofuels	http://www.balticsea-region-strategy.eu/component/edocman/eusbsr-action-plan
Industry, Enterprise	Yes / No		
Environment (incl. resource efficiency, sustainability, water use)	Yes	Biomass use for climate change mitigation; the Baltic Sea region as a leader in sustainable biomass production for food, fibre and energy	http://www.balticsea-region-strategy.eu/component/edocman/eusbsr-action-plan
Eco-System Services	Yes / No		
Regional development and Smart Specialisation	Yes	Innovation and Research Strategy for Smart Specialization refers to the Environment, Bioenergy and Biotechnology Competence centre which aims to increase competitiveness of businesses by facilitating cooperation of research and industry sectors in implementation of projects for industrial research, development of new products and technologies. The Baltic Sea region as a leader in sustainable biomass production	http://www.ris3.lv/documents http://www.balticsea-region-strategy.eu/component/edocman/eusbsr-action-plan
Education/Skills	Yes / No		
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[72]	**Link**[73]
Agriculture	**1** **2 – legumes as source of protein for food and feed** **3 – conversion of livestock waste into biogas and manuring**	
Forestry	**1** **3**	
Marine/Fisheries/Aquaculture The Baltic Sea	**1 – sustainable fisheries**	
Waste	**1**	
Agri-Food & Food security	**2**	
Food, Healthy diet	**2**	
Research & Innovation		
Green Growth Strategy		
Blue Growth Strategy		
Energy, including Bioenergy	**3**	
Industry, Enterprise	**3** **4**	
Environment (incl. resource efficiency, sustainability, water use)	**3**	
Eco-System Services		
Regional development and Smart Specialisation		
Education/Skills		

[72] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[73] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	Sustainable Use of Local Resources (Entrails of the Earth, Forest, Food and Transport) – New Products and Technologies (NatRes) http://kki.lv/index.php?lang=en&id=117 National Research Programmes http://izm.izm.gov.lv/nozares-politika/zinatne/valsts-petijumu-progr/2014.html#pv21	The aim: create possibilities for application of non-residual technologies to produce new and innovative products and to increase the competitiveness of enterprises, using local raw materials of plant and animal origin. Use of food production by-products in high added value food and feed production.	
Forestry	Sustainable Use of Local Resources (Entrails of the Earth, Forest, Food and Transport) – New Products and Technologies (NatRes) http://kki.lv/index.php?lang=en&id=116	Development of innovative forest management technologies, creation of innovative wood and non-wood products, rational utilisation of the forestry resources and considerable increase the products' added value.	
Marine/Fisheries/Aquaculture			
Waste as Biomass source			
Food/feed use of biomass (food/feed value chains)	Sustainable Use of Local Resources (Entrails of the Earth, Forest, Food and Transport) – New Products and Technologies (NatRes) http://kki.lv/index.php?lang=en&id=117	The aim: create possibilities for application of non-residual technologies to produce new and innovative products and to increase the competitiveness of enterprises, using local raw materials of plant and animal origin.	
Energy use of biomass (bioenergy)	National Research Programmes http://izm.izm.gov.lv/nozares-politika/zinatne/valsts-petijumu-progr/2014.html#pv21	Use of waste in biogas production	

Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**			
Key Enabling Technology (Industrial Biotechnology)	Environment, Bioenergy and Biotechnology Competence centre http://www.vbbkc.lv/?petijumi&sid=1 Latvian Biotechnology association http://en.latbiotech.lv/	The Centre coordinates research projects (e.g. Study of potential formulations of new biotechnological products to substitute chemically synthesized substances with substances from nature) „Latvian Biotechnology association" has been established with purpose: to promote biotechnology sphere in Latvia. Intention of Association – to embrace more methods of biotechnology, which can be useful for development of Latvian economy and to encourage international cooperation.	- (only ERDF funding)
Communication, stakeholder involvement			
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

Aloja Starkelsen, Getliņi EKO, AS Biolat, Ltd. Latgran

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions	4		Common GHG emission targets etc. limit the economic and social development – comparing to other MS, Latvia is one of the ''greenest'' countries but at the same time it restricts reaching the average standard of living in EU.
Resource efficiency			
Renewable resources/ bio-based products			
Knowledge transfer and good practice and innovation	5		
Economic/ market framework	5		
Policy framework	5		
Healthy food research	5	EUROLEGUME	
Bioenergy			
Animal feed		EUROLEGUME	
Development of an agreed methodology for environmental footprints			
Biorefineries			
Food security			
Social inclusion	5		
Algae			
Genetics			
Other areas, please specify			

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NL – THE NETHERLANDS

Joint Survey on National Bioeconomy Strategies

Country:	**Netherlands**
Year of data collection:	2014 (unless stated otherwise)
Contact mail person in charge of data collection:	Jan van Esch

This survey consist of two parts. It is aimed to collect data on:

(29) National Bioeconomy Policies and

(30) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

The term bioeconomy is not yet much used in the Netherlands. When there is a reference to bioeconomy than it is the European defenition of bioeconomy.
What is closed to bioeconomy is the green growth as it is proposed in the goverment letter to the parliament .
Biobased economy is used to adress that part of the economy that is active in producing biobased matrials and products and bio-energy, with interest in the biomass needed for that.

Please describe where your country's definition is different from the EU definition of the bioeconomy.[74]

No difference

[74] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Q2.1 Contribution/implementation of the EU strategy on Bioeconomy		
Q2.2 Food security/ land-use competition	3	Beleidsbrief duurzaam voedsel: http://www.rijksoverheid.nl/documenten-en-publicaties/kamerstukken/2013/07/11/beleidsbrief-duurzame-voedselproductie.html Facce-JPI
Q2.3 Healthy diet		
Q2.4 Independence from fossil resources/security of supply	3	Is important in horticulture, see forsight horticulture. Where energie efficiency and sustainable energy production are very important.
Q2.5 Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	5	http://www.rijksoverheid.nl/onderwerpen/ondernemersklimaat-en-innovatie/documenten-en-publicaties/kamerstukken/2011/09/13/kamerbrief-naar-de-top-het-bedrijvenbeleid-in-actie-s.html www.government.nl/issues/...**top-sector**s/**agri-food**
Q2.6 Development of new bioeconomy sectors (bioenergy, industrial biobased products)	5	Topsector Chemie, topsector energie, TKI Biobased. *www.**tki**-bbe.nl*
Q2.7 Maintaining business base and employment	3	Is part of green Growth: 'kamerbrief-groene-groei-voor-een-sterke-duurzame-economie.pdf And national energy agreement: '*www.**energieakkoordser**.nl'*
Q2.8 New business, increased employment	5	See 'topsectoren'.
Q2.9 Mitigation of climate change/adaptation to climate change	4	Convenant schoon en zuinige agrosectoren' Netherlands take active rol in FACCE –JPI on this point.

Q2.10 Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)		
Q2.11 Resource efficient economy (reduction of waste, use of residues)	4	http://www.rijksoverheid.nl/onderwerpen/ondernemersklimaat-en-innovatie/documenten-en-publicaties/kamerstukken/2011/09/13/kamerbrief-naar-de-top-het-bedrijvenbeleid-in-actie-s.html
Q2.12 Societal demand	2	
Q2.13 Other drivers – please specify	Green Growth: sustainable food production, energy agreement and biobased combined	green Growth: 'kamerbrief-groene-groei-voor-een-sterke-duurzame-economie.pdf

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Q3a.1 **Does your country have a National Bioeconomy strategy ?**	Partly	Name of the strategy: 'Green growth ' (kamerbrief-groene-groei-voor-een-sterke-duurzame-economie.pdf') and 'Framework memorandum on the Biobased Economy'. What misses is food security. Link: PDF ENHoofdlijnennotitie I
Q3a.2 **Ministry(ies) in charge of the Bioeconomy strategy ?**	1 main ministry: EZ	Economic affairs (EZ) *www.rijksoverheid.nl/**ministeries**/**ez*** Infrastructure and environment (I&M) Forreignaffairs (BZ)
Q3a.3 **Does your country have a Bioeconomy advisory body/panel ?**	Partly	Name of the body: TKI biobased Link: *www.**tki**-bbe.nl*
Q3a.4 **Does your country have a Bioeconomy agency or agencies ?**	Yes	Name of the agency: RVO Link: *www.**rvo**.nl/*
Q3a.5 **Does your country have a Bioeconomy observatory collecting data/info ?**	partly	Name of the body: RVO Link: *www.**rvo**.nl/*
Q3a.6 **Does your country have a Bioeconomy National Contact point ?**	partly	Name: Kees Kwant, Jan van Esch Contact: Kwant, ir. K.W. (Kees) <kees.kwant@rvo.nl>

Q3b Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[75]
Q3b.1 **Agriculture**	Yes	Covers biomass from agriculture	http://www.rlg.nl/nieuws/2014/beantwoording-kamervragen-advies-ruimte-voor-duurzame-landbouw
Q3b.2 **Forestry**	Yes	rijksnatuurvisie	*www.rijksoverheid.nl/onderwerpen/natuur-en-biodiversiteit/**natuurvisie***
Q3b.3 **Marine/Fisheries/Aquaculture**	Yes		*www.rijksoverheid.nl/**visserij***
Q3b.4 **Waste**	Yes	Vang programma: van afval naar grondstof	*www.rijksoverheid.nl/.../mansveld-wil-hoeveelheid-afval-halveren.html*
Q3b.5 **Agri-Food & Food security**	Yes	Food quality and food security both important parts of bioeconmy	
Q3b.6 **Food, Healthy diet**	Yes	Touches upon bioeconomy	
Q3b.7 **Research & Innovation**	Yes	Bases for bioeconomy	http://www.rijksoverheid.nl/onderwerpen/ondernemersklimaat-en-innovatie/documenten-en-publicaties/kamerstukken/2011/09/13/kamerbrief-naar-de-top-het-bedrijvenbeleid-in-actie-s.html
Q3b.8 **Green Growth Strategy**	Yes	Covers most fields of bio-economy	green Growth: 'kamerbrief-groene-groei-voor-een-sterke-duurzame-economie.pdf
Q3b.9 **Blue Growth Strategy**	Yes / No		
Q3b.10 **Energy, including Bioenergy**	Yes	energieakkoord	*www.**energieakkoordser**.nl'*
Q3b.11 **Industry, Enterprise**	Yes	topsectorenbeleid	http://www.rijksoverheid.nl/onderwerpen/ondernemersklimaat-en-innovatie/documenten-en-publicaties/kamerstukken/2011/09/13/kamerbrief-naar-de-top-

[75] Please provide English link (if available)

			het-bedrijvenbeleid-in-actie-s.html
Q3b.12 **Environment (incl. resource efficiency, sustainability, water use)**	Yes	Important part of green growth	green Growth: 'kamerbrief-groene-groei-voor-een-sterke-duurzame-economie.pdf
Q3b.13 **Eco-System Services**	Yes / No		
Q3b.14 **Regional development and Smart Specialisation**	Yes	Partnerschaps akkoorden structuur-fondsen	
Q3b.15 **Education/Skills**	Yes / No	HCA agenda tiopsectoren	http://www.rijksoverheid.nl/onderwerpen/ondernemersklimaat-en-innovatie/documenten-en-publicaties/kamerstukken/2011/09/13/kamerbrief-naar-de-top-het-bedrijvenbeleid-in-actie-s.html
Q3b.16 **Other areas, please specify**	yes	Biobased economy, part of the bio-economy that focus on materials and energy, and the biomass needed for that.	PDF ENHoofdlijnennotitie I Policy letter 'more value from biomass by cascading' Policy letter: Evaluatie en monitoring programma biobased economy (evaluation and monitoring programm biobased economy)

Q3c **Please list Bioeconomy regions and/or clusters in your country (if available)**		
Name	**Description of the focus/specialisation**[76]	**Link**[77]
Q3c.1 **Food valley**	**Wageningen area, agriculture and food**	*www.**foodvalley**.nl/*
Q3c.2 **Energy valley**	**Groningen/ Drenthe area. Bioenergy**	**www.**energyvalley**.nl/**
Q3c.3 **Green ports**	**Venlo, Aalsmeer, Westland ??, horticulture**	***greenport**holland.com/zes-**greenports***
Q3c.4 **Biobased southwest Neth-erlands**	**Zuid-Holland, West Brabant Zeeland. Biorefineries, materialen**	*www.**biobaseddelta**.nl/*
Q3c.5 **Biobased North Nether-lands**	**Carbo hydrate competence centre**	**http://www.cccresearch.nl/index_en.htm**
Q3c.6 **Camelot**	**Limburg biobased/ chemicals centre**	
Q3c.7 **Bio-con**	**Oost-Nederland**	
Q3c.8 **Biobased innovation**	**Amsterdam**	
Q3c.9 **Seed Valley**	**Enkhuizen, seeds**	*www.**seedvalley**.nl/*

[76] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[77] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	Topsector A&F Topsector TU	Innovation program to support agriculture and food Innovation program to support horticulture and feedstock for breeding	72 milj. from goverment and 185 milj. from industry 64 milj. from goverment and 140 milj from industry
forestry			
Marine/Fisheries/Aquaculture	Topsector water	Wetsus, Algae parc	
Waste as Biomass source			
Food/feed use of biomass (food/feed value chains)			
Energy use of biomass (bioenergy)	Topsector energie	Innovation program to support sustainable enrgy use	Already in biobased
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	TKI biobased Public privat research and innovation programms	Innovation program targetted and biobased products and materials Biobased Performance materials Catchbio Carbohydrate Compentence Center (CCC)	63 milj. from goverment and 140 milj from industry
Key Enabling Technology (Industrial Biotechnology)	B-Basic Bio-solar cells	Fundamental research for biobased technology and more efficient use of soalr energy	10 6
Communication, stakeholder involvement			
Other areas, please specify	Government research program	Research funding for environment, research needed for poicy making and fundamental research	Total of 146 milj.

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

Q5.1
Cosun : Campus Groen Prinsenland *www.cosun.nl › Nieuws*

Q5.2

AVEBE: generate proteine from waste stream potatoes *www.**avebe**.nl/Innovatie/Innovatiedoor**AVEBE**.aspx*

Q5.3

Grassa: biorefinery of gras www.*grassa*.nl/

Q5.4

BPM: R&D on Bioplastic polymers *www.**biobased**performancematerials.nl/*

(see also examples of WTC book)

II Research & Development

Q 6: Potential benefit of European research cooperation

	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Q6.1 Common sustainability criteria/ GHG emmissions	5		
Q6.2 Resource efficiency	3		
Q6.3 Renewable resources/ bio-based products	3		
Q6.4 Knowledge transfer and good practice and innovation	3		
Q6.5 Economic/ market framework	5		
Q6.6 Policy framework	5		
Q6.7 Healthy food research	5		
Q6.8 Bioenergy	3		
Q6.9 Animal feed	3		
Q6.10 Development of an agreed methodology for environmental footprints	5	Green Deal Green certificates for biobased products (cooperation with Germany INRO)	
Q6.11	3		

Biorefineries			
Q6.12 **Food security**	5		
Q6.13 **Social inclusion**	3		
Q6.14 **Algae**	3		
Q6.15 **Genetics**	3		
Q6.15 **Other areas, please specify**			

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Strategic Working Group on Biomass

NO - NORWAY

Joint Survey on National Bioeconomy Strategies

Country:	
Year of data collection:	2014
Contact mail person in charge of data collection:	tep@rcn.no

This survey consist of two parts. It is aimed to collect data on:

(31) National Bioeconomy Policies and

(32) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

Norway does not have a national bioeconomy strategy. Up to now we have used the definition of bioeconomy used by the European Union.

Please describe where your country's definition is different from the EU definition of the bioeconomy.[78]

Please note that the EU definition includes the term "fisheries". Other marine resources either produced from aquaculture activities or harvested in the sea such as non vertebrates or algae have a high bioeconomic potential and could be more visible in the definition.

[78] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	1	Low priority due to the fact that Norway is not a Member State of the EU
Food security/ land-use competition	4	
Healthy diet	3	Food and health is important, but not the most important driver for development of the bioeconomy
Independence from fossil resources/security of supply	2	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	5	Please include aquaculture in these domains. EU tend to forget/neglect aquaculture
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	5	
Maintaining business base and employment	4	
New business, increased employment	4	
Mitigation of climate change/adaptation to climate change	4	
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	2	This is important in general, but not as a driver for the bioeconomy.
Resource efficient economy (reduction of waste, use of residues)	4	
Societal demand	1	
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	No	Name of the strategy: Link:
Ministry(ies) in charge of the Bioeconomy strategy ?	None	Name of the responsible Ministry/ Ministries: Link:
Does your country have a Bioeconomy advisory body/panel ?	No	Name of the body: Link:
Does your country have a Bioeconomy agency or agencies ?	No	Name of the agency: Link:
Does your country have a Bioeconomy observatory collecting data/info ?	No	Name of the body: Link:
Does your country have a Bioeconomy National Contact point ?	No	Name: Contact:

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[79]
Agriculture	Yes	Bioeconomy is mentioned in the last governmental white paper on food production and forestry	N.a in english
Forestry	Yes	Bioeconomy is mentioned in the last governmental white paper on food production and forestry	N.a in english
Marine/Fisheries/Aquaculture	Yes	This is one of Norways strongest policy domains. The concept of bioeconomy is not used in the white paper, but it is strongly relevant.	N.a in english
Waste	No		
Agri-Food & Food security	Yes	Bioeconomy is mentioned in the last governmental white paper on food production and forestry	N.a in english
Food, Healthy diet	Yes / No	Bioeconomy is mentioned in the last governmental white paper on food production and forestry	N.a in english
Research & Innovation	Yes	Biotechnology is mentioned but not bioeconomy	
Green Growth Strategy	No		
Blue Growth Strategy	Yes	This is one of Norways strongest policy domains. The concept of bioeconomy is not used in the white paper, but it is strongly relevant.	N.a in english
Energy, including Bioenergy	Yes	Bioenergy is included but not a prioritised domain of the strategy. Bioeconomy is not used as concept. Bioenergy is mentioned in the last governmental	http://www.energi21.no/prognett-energi21/Home_page/1253955410599 N.a in english

[79] Please provide English link (if available)

		white paper on food production and forestry	
Industry, Enterprise	No		
Environment (incl. resource efficiency, sustainability, water use)	No		
Eco-System Services	Yes	Eco-System Services is mentioned in the last governmental white paper on food production and forestry.	N.a in english
Regional development and Smart Specialisation	No		
Education/Skills	No		
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[80]	**Link**[81]
	Arena BioTech North (Troms)	**http://biotechnorth.no/**
	NCE Aquaculture	**http://www.nceaquaculture.com/**
	akvARENA (Trøndelag)	**http://akvarena.no/index.php?page=home**
	Arena Heidner (Hedmark)	**http://www.hkp.no/english/**

[80] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[81] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	BIONÆR http://www.forskningsradet.no/prognett-bionaer/Home_page/1253971968569		30 Million € / year
Forestry	BIONÆR http://www.forskningsradet.no/prognett-bionaer/Home_page/1253971968569		
Marine/Fisheries/Aquaculture	BIONÆR http://www.forskningsradet.no/prognett-bionaer/Home_page/1253971968569 HAVBRUK http://www.forskningsradet.no/prognett-havbruk/Home_page/1226994216880 HAVET og KYSTEN (Fisheries) http://www.forskningsradet.no/prognett-havkyst/Home_page/1226994156364 BIOTEK2021 http://www.forskningsradet.no/prognett-biotek2021/Home_page/1253970728140		18 Million € / year Ca. 10 Million € / year Ca. 18 Million € / year
Waste as Biomass source	BIONÆR		

	http://www.forskningsradet.no/prognett-bionaer/Home_page/1253971968569 BIOTEK2021 http://www.forskningsradet.no/prognett-biotek2021/Home_page/1253970728140		
Food/feed use of biomass (food/feed value chains)	BIONÆR http://www.forskningsradet.no/prognett-bionaer/Home_page/1253971968569 HAVBRUK http://www.forskningsradet.no/prognett-havbruk/Home_page/1226994216880 BIOTEK2021 http://www.forskningsradet.no/prognett-biotek2021/Home_page/1253970728140		20 Million € / year
Energy use of biomass (bioenergy)	ENERGIX http://www.forskningsradet.no/prognett-energix/Home_page/1253980140022		45 Million € / year
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	BIONÆR http://www.forskningsradet.no/prognett-bionaer/Home_page/1253971968569 BIOTEK2021 http://www.forskningsradet.no/prognett-biotek2021/Home_page/1253970728140 BIA http://www.forskningsradet.no/prognett-bia/Home_page/1226993636038		50 Million € / year
Key Enabling Technology (In-	BIOTEK2021		

dustrial Biotechnology)	http://www.forskningsradet.no/prognett-biotek2021/Home_page/1253970728140		
Communication, stakeholder involvement	All mentioned programmes		
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

We would like to emphasise a couple of success stories of bioeconomy research funding in Norway. During the last two-three years the Research Council of Norways R&D-programme BIONAER has provided funding to a number of large scale projects (Ca. € 5 million per project) with specific bioeconomy properties. Typically it is required that the projects shall achieve complete biological closed-loop systems; incorporating the environmental, social and economic aspects of sustainability across the board; maintaining consistent focus on market orientation and value creation in the Norwegian bio-based industries; promoting interdisciplinarity to ensure the societal relevance of knowledge-building under the programme.

The other success story we would like to emphasise is the funding of four radically innovative bioeconomy research projects. The call was organised as a socalled sandpit, with creative methodology used for many years by the research councils of UK, for more information see http://knowinnovation.com/in-the-sandpit/

II Research & Development Q 6: Potential benefit of European research cooperation			
	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions			
Resource efficiency			
Renewable resources/ bio-based products			
Knowledge transfer and good practice and innovation			
Economic/ market framework			
Policy framework			
Healthy food research			
Bioenergy			
Animal feed			
Development of an agreed methodology for environmental footprints			
Biorefineries			
Food security			
Social inclusion			
Algae			
Genetics			
Other areas, please specify			

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

SCAR
Standing Committee on Agricultural Research

Strategic Working Group on Biomass

SE - SWEDEN

Joint Survey on National Bioeconomy Strategies

Country:	**SWEDEN**
Year of data collection:	2014
Contact mail person in charge of data collection:	stefan.kallman@gov.se

This survey consist of two parts. It is aimed to collect data on:

(33) National Bioeconomy Policies and

(34) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

We have defined a bio-based economy (bioeconomy) as an economy based on:
• A sustainable production of biomass to enable increased use within a number of different sectors of society. The objective is to reduce climate effects and the use of fossilbased raw materials.
• An increased added value for biomass materials, concomitant with a reduction in energy consumption and recovery of nutrients and energy as additional end products. The objective is to optimize the value and contribution of ecosystem services to the economy.

Please describe where your country's definition is different from the EU definition of the bioeconomy.[82]

[82] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	5	
Food security/ land-use competition	3	
Healthy diet	2	
Independence from fossil resources/security of supply	5	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	4	
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	5	
Maintaining business base and employment	4	
New business, increased employment	5	
Mitigation of climate change/adaptation to climate change	5	
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	4	
Resource efficient economy (reduction of waste, use of residues)	5	
Societal demand	3	
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	Yes	Name of the strategy: Sweden has a national research and innovation strategy. A national bio-economy strategy is on its way. Link: http://www.formas.se/Forskning/Formas-Publikationer/Swedish-Research-and-Innovation-Strategy-for-a-Bio-based-Economy/
Ministry(ies) in charge of the Bioeconomy strategy ?	Yes / No	Name of the responsible Ministry/ Ministries: No formal responsibilities exists. Ministry for Rural Affairs took the initiative but now also the Ministry of Enterprise & Energy has bioeconomy on its agenda. There is a strong cooperation between Swedish ministries. Link:
Does your country have a Bioeconomy advisory body/panel ?	Not yet	Name of the body: A panel was proposed in the national research & innovation strategy. Has not yet been implemented. However, a joint Nordic bio-economy panel will be established during 2014. Link:
Does your country have a Bioeconomy agency or agencies ?	No	Name of the agency: “Bio-economy” is a horizontal subject for all agencies dealing with biomass, climate issues etc. Link:
Does your country have a Bioeconomy observatory collecting data/info ?	No	Name of the body: No special appointed observatory. Sweden has a broad range of agencies and institutions that collect applicable and relevant data. E.g. Research funding agencies. On the Nordic level (Nordic Council of Ministers) different projects are ongoing. The Icelandic Chairmanship for NCM during 2014 has a Nordic bio-economy as one of their priorities (NordBio). Link: www.norden.org, http://www.mfa.is/foreign-policy/nordic-cooperation/nordic-council/icelands-presidency-2014-/projects/nr/7880
Does your country have a Bioeconomy National Contact point ?	Yes / No	Name: No formal contact point. Dr. Stefan Källman, Ministry for Rural Affairs, is considered as some kind of “contact point” together with Dr. Jan Svensson at the Research Council Formas. Contact: stefan.kallman@gov.se jan.svensson@formas.se

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[83]
Agriculture	Yes / No	Not yet but the bio-economy is higher on the agenda today and is considered as one of future important opportunities.	
Forestry	Yes	The Ministry for Rural Affairs has launched the policy initiative "Sweden: the Forest Kingdom" which has bio-economy on its agenda. The Swedish Forest Industries Federation, has bio-economy as one of their future corner stones.	http://www.government.se/sb/d/14980/a/171804 http://www.forestindustries.se/i_fokus_-_startsidenotiser_1/the-forest-industry-–-the-driver-for-a-sustainable-bioeconomy
Marine/Fisheries/Aquaculture	Yes/No	Bio-economy is a part of the discussions	
Waste	Yes / No	No policy just for waste. Waste is considered as an important subject in the bio-economy discussions etc and is included in the usable biomass resources.	
Agri-Food & Food security	Yes/No	Bio-economy is a part of the food chain to increase the value of the food chain, to replace fossil material used in the production chain and and better use of residues.	
Food, Healthy diet	No		
Research & Innovation	Yes	Sweden has a (Governmental) research & innovation strategy for a bioeconomy. Several programs and projects are launched from governmental funding agencies	http://www.formas.se/Forskning/Formas-Publikationer/Swedish-Research-and-Innovation-Strategy-for-a-Bio-based-Economy/ http://www.formas.se/en/financing/calls-for-proposals/forestry-raw-materials-and-biomass-sustainable-primary-production-new-

[83] Please provide English link (if available)

		and public - private partnerships.	materials-and-bio-based-products-for-a-bio-based-economy http://www.formas.se/en/Press-News/News/Its-the-bioeconomy-stupid/ http://www.formas.se/en/financing/calls-for-proposals/effective-and-sustainable-production-systems-in-agri-and-aquaculture http://www.vinnova.se/PageFiles/751324632/A%20BIO-based%20Economy.pdf http://www.vinnova.se/sv/Var-verksamhet/Gransoverskridande-samverkan/Samverkansprogram/Strategiska-innovationsomraden/SIO-program/Nya-biobaserade-material-produkter-och-tjanster/ www.bioinnovation.se http://www.stratresearch.se/global/utlysning_pdf/RBP14_en.pdf http://www.energimyndigheten.se/en/Search-the-website/?quicksearchquery=biofuels http://www.sp.se/en/Sidor/default.aspx http://www.sp.se/sv/index/research/bioresurser/Sidor/default.aspx
Green Growth Strategy	Yes	Bio-economy is a part of the green growth strategy discus-sions.	
Blue Growth Strategy	Yes / No	No special strategy but “blue growth bioeconomy” research projects are funded	
Energy, including Bioenergy	Yes	Bioenergy and biofuels are very outstanding in the Swedish ener-gy and bio-economy discussions. Several policies exists.	e.g. http://www.government.se/sb/d/14980/a/171804 http://www.government.se/sb/d/574/a/123466

Industry, Enterprise	Yes	See link above! See also former links to Swedish Forest Industries Federation	www.forestindustries.se http://advantage-environment.com/framtid/sustainable-chemistry-2030/
Environment (incl. resource efficiency, sustainability, water use)	Yes / No	Several environmental policies but no special related to bio-economy	
Eco-System Services	Yes / No	Will probably soon be on the agenda	
Regional development and Smart Specialisation	No		
Education/Skills	Yes / No	“Bio-economy” is an integrated part of e.g. of the education at the Swedish University of Agricultural Sciences, technical universities etc.	http://www.slu.se/en/about-slu/strategies-and-evaluations/slus-strategy-2013-2016/a-bio-based-economy/ http://www.kth.se/en/om/organisation/skolor/skolan-for-bioteknologi-bio-1.3853 http://www.chalmers.se/en/areas-of-advance/energy/research/Pages/Biobased-Economy.aspx
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[84]	**Link**[85]
BioInnovation	**A new public-private research & innovation partnership, total > 12 M Euro/year until 2020. Funded by governmental research funding agencies VINNOVA (majority) and Formas (www.vinnova.se, www.formas.se) and 58 companies, universities and institutes. Coordinated by the Swedish Forest Industries Federation. Will also be supported by other funding schemes.** **Bioinnovation is a cross-industry initiative to develop a strong, competitive and innovative materials, products and services from Swedish bio-based raw materials.** **With renewable raw materials in the center now draws the SIA (Strategic Innovation Area", new instrument launched in the present Research Bill) "New bio-based materials, products and services" called bioinnovation, running. VINNOVA has today decided to contribute half the funding for the largest Swedish program in the field.** **Bioinnovation will contribute to Sweden's ability to take a strong position in the global emerging biobased economy. The potential of Swedish biomass resources from forests, agricultural land, water, and waste forms the base. The program shows how state funds can support stakeholders in the strategic area of innovation to bridge the traditions, boundaries and structures, and to establish new collaborations and development in conjunction with existing efforts. Expected effects are new innovations leading to bio-based materials, products and services that increase the international competitiveness of Swedish companies and increased export value for Sweden.** **Code: 4**	**www.bioinnovation.se** **(not yet in work 100%)**
Processum	**Forest biomass** **Code: 1, 3, 4**	http://www.processum.se/en/

[84] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[85] Please provide English link (if available)

		http://www.sp.se/en/units/spprocessum/Sidor/default.aspx
Sustainable Chemistry 2030	**Chemistry** **Code: 4**	http://www.kemiforetagenistenungsund.se/pdf/foldereng.pdf
Five Clusters (West Coast, Gothenburgh region)	**The five clusters are** **• Urban future** **• The marine environment and the maritime sector** **• Transport solutions** **• Green chemistry and bio based products** **• Life science** **Code:1, 3, 4**	http://www.businessregion.se/download/18.746721d7133f64d11718000940/Broschyr_Five_Clusters.pdf

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PubLicFunding allocated to the programme (€ / year)**
Agriculture	Formas Annual Open Call. http://www.formas.se/en/Financing/Formas-annual-open-call-2013/	Bottom call for proposals in the areas of responsibility of *Formas-the Swedish Research council for environment, agricultural sciences and spatial planning*. **Most bioeconomy relevant proposals(**agriculture,forestry, fisheries, waste) **in the evaluation panels 3. Use of natural resources and 4. Resource efficient products and processes**	About 12 M€/yr (out of 50 M€/yr)
	Efficient and sustainable production systems within aquaculture and agri- and horticulture (Call 2013): http://www.formas.se/en/financing/calls-for-proposals/effective-and-sustainable-production-systems-in-agri-and-aquaculture	Joint call (only 2013) between three funding organisations Formas, Mistra and Farmers association. Production and efficiency in agri-, horti and aquaculture	6,5 M€/(4 yrs)
	Swedish Foundation for Strategic Research: Call on Biological Production Systems 2014: http://www.stratresearch.se/global/utlysning_pdf/RBP14_en.pdf	Targeted call for problem- or application-driven research project proposals on biological production systems yr 2015-2019. Total funding 225 MSEK	ca. 5 M€/yr
	Mistra Biotech http://www.slu.se/en/collaborative-centres-and-projects/mistra-biotech/	**Mistra Biotech** is an interdisciplinary research programme focusing on the use of biotechnology for sustainable and competitive agriculture	ca. 4.5 M€/yr
	The Swedish Farmers' Foundation for Agricultural Research – is the Swedish agricultural industry's organisation for growing knowledge by funding research and development. The purpose of the foundation is to	The Swedish agricultural industry has created its own voluntary system for funding R&D. The system is based on both agricultural cooperatives and private companies collecting funds from farmers by a proportional tariff on inputs and agricultural products.	Ca. 5.5 M€/yr

	strengthen the competitive ability of the Swedish agricultural sector. http://www.lantbruksforskning.se/?sid=598	A new **public-private** applied research program (incl. biomass/bioeconomy) was established 2013.	
Forestry	Forest rawmaterials and biomass programme (http://www.formas.se/en/financing/calls-for-proposals/forestry-raw-materials-and-biomass-sustainable-primary-production-new-materials-and-bio-based-products-for-a-bio-based-economy)	Research relevant to biomass supply and processing for a growing bio-based economy (Mainly forestry but also other biomass producing sectors, different calls and targets)	4,5 M€ /2014 upto 11 M€ /2016 (then permanent)
Marine/Fisheries/Aquaculture			
Waste as Biomass source			
Food/feed use of biomass (food/feed value chains)			
Energy use of biomass (bioenergy)	BIOENERGY/FUEL Programmes -2015 (in Swedish only): http://www.energimyndigheten.se/Forskning/Bransleforskning/Bransleprogrammen/	Swedish Energy Agency: 3 programmes on bioenergy Supply, Conversion, Sustainability. 4 years ending June 2015. Total 240 MSEK public funding + varying cofunding.	6,5 M€/yr
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other in-**	http://www.innventia.com/en/ http://www.innventia.com/en/Projects/Ongoing-projects/	**Innventia** is a world-leading research institute that works with innovations based on forest raw materials. The majority of our operations are carried out in project form via research programmes involving many partners, such as the three-year Cluster Research Programme, or in development projects with individual customer companies. Innventia collaborates extensively with universities and colleges, for example through projects financed by the EU or Vinnova.	

dustrial uses			
Key Enabling Technology (Industrial Biotechnology)	www.Vinnova.se http://www.vinnova.se/en/Publications-and-events/Calendar/2013/130912-Industrial-Biotechnology---Meeting-the-challenges/	Industrial biotechnology is a key technology area for the emerging bio-based economy. Based on microorganisms and their enzymes as catalytic tools, it provides mild and environment-friendly processes for the production of chemicals, materials and biofuels.	
Communication, stakeholder involvement			
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

Swedish Wood Building. http://www.trabyggnadskansliet.se/english

Future Forests: http://www.slu.se/en/collaborative-centres-and-projects/future-forests/

Sustainable Chemistry: http://advantage-environment.com/framtid/sustainable-chemistry-2030/

Future Agriculture: http://www.slu.se/en/collaborative-centres-and-projects/future-agriculture/

II Research & Development Q 6: Potential benefit of European research cooperation			
	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions	5	Yes, through JPI Climate and FACCE JPI, Earlier CSA www.visionRD4SD.eu, Nordic Council – programmes between Nordic countries and Baltic states, in agriculture, forestry and energy areas	
Resource efficiency	5		
Renewable resources/ bio-based products	5	Woodwisdom Net ERA-net programmes	
Knowledge transfer and good practice and innovation	4	EIP-Agri, SCAR/AKIS	
Economic/ market framework	3		
Policy framework	3		
Healthy food research	2		Not a core subject in bioeconomy programme, but in Health and food security/safety
Bioenergy	5		
Animal feed	2		Not a core subject in bioeconomy programme, but in health and food security/safety
Development of an agreed methodology for environmental footprints	?		
Biorefineries	5	PPP Biobased Industries	
Food security	2		Not a core subject in bioeconomy programme, but in health and food security/safety
Social inclusion			
Algae	5		

Genetics	5		International collaboration to create critical mass in specific fields of crop, tree and animal breeding as well as molecular genetics
Other areas, please specify			

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

SCAR
Standing Committee on Agricultural Research

Strategic Working Group on Biomass

SI - SLOVENIA

Joint Survey on National Bioeconomy Strategies

Country:	
Year of data collection:	2014
Contact mail person in charge of data collection:	jana.erjavec@gov.si

This survey consist of two parts. It is aimed to collect data on:
(1) National Bioeconomy Policies and
(2) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

Please describe where your country's definition is different from the EU definition of the bioeconomy.[86]

Slovenia in its strategic documents does not apply and nowhere specifically defines the definition of "bioeconomy".

[86] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy		
Food security/ land-use competition	5	Strategy for the implementation of the resolution on the strategic direction of development of Slovenian agriculture and agri-food sectors by 2020 (hereinafter: the Strategy of Agriculture), which was adopted by the Government Sites June 2014 and is also the basis for the implementation of the RDP. The Strategy of Agriculture provides and ensures food security with a stable production of safe, quality and affordable food to the consumer; increasing the competitiveness of the agriculture and food; sustainable use of production potential and providing agriculture-related public goods and ensure a coherent and socially sustainable rural development.
Healthy diet		
Independence from fossil resources/security of supply	5	**PA (PARTNERSHIP AGREEMENT between Slovenia and the European Commission for the period 2014-2020):** **TC 4 (THEMATIC OBJECTIVE 4):** Supporting the shift towards a low-carbon economy in all sectors …. **IE (INVESTMENT AREAS):** Support to production and distribution of renewable energy.

Rationale: Contribution to the EU 2020 objectives: with accelerated investment primarily in areas of great RES potential (water, wood, geothermal and solar energy), Slovenia can realise its national goal in the context of the climate and energy package (25 % of RES in final energy consumption) – 20.2 % in 2012.

EXPECTED RESULTS:
- Increased share of renewable energy in total energy use
- Reduced greenhouse gas emissions

TC 3 (THEMATIC OBJECTIVE 3): Enhancing the competitiveness of SMEs, the agricultural sector (for the EAFRD) and the fisheries and aquaculture sector (for the EMFF)

Energy efficiency of agricultural holdings and food-processing facilities is to be promoted in the 2014–2020 period with investments, co-financed through the Rural Development Programme for the period 2014-2020. The aim is to cut production costs and reduce consumption of primary energy, which will reduce heavy dependence on non-renewable energy sources (fossil fuels). Energy efficiency also directly contributes to reducing GHG emissions and thus mitigates climate change. The shift towards an energy-efficient, low-carbon agriculture and agro-food industry will pave the way towards a rapid roll-out of technological solutions and will help step up the competitiveness of both sectors, which will make a contribution to thematic objective 4.

RDP (Rural Development Programme) for the period 2014 – 2020

Measure M04: Investments in phyisical assets:

The objective of facilitating the supply and use of renewable energy sources, by-products, waste and residues, and other non-food products for bio-economy is intended to be promoted through the Investments in physical assets measure (Article 17 of Regulation 1305/2013/EU) which will support investments in energy efficiency, more efficient use of inputs, use of waste and other residual products, genera-

		tion of energy from biogas and other renewable energy sources, such as wood biomass, geothermal energy, etc. **Rationale:** Biogas, geothermal energy, solar energy and use of biomass are currently the key renewable energy sources, which have a great potential for development. With reduction of the fragmentation of agricultural land, increasment of energy efficiency of buildings, machinery and equipment, different ways of tillage, which reduces fuel consumption, it is possible to improve the energy efficiency of agricultural holdings **Expected results:** Increase in the use of renewable energy on agricultural holdings / processing facilities and increase of their energy efficiency can improve their environmental performance and reduce dependence on non-renewable energy sources.
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	5 4	The strategy of agriculture objectives include: ensuring food security through stable production of safe, quality and affordable food to the consumer; increasing the competitiveness of the agriculture and food; sustainable use of production potential and providing agriculture-related public goods is very important for Slovenia. . Due to the high share of **forest** in Slovenia (58,4%) and increasing growing stock and increment higher share of use of wood for bioenergy is expected.
Development of new bioeconomy sectors (bioenergy, industrial biobased products)		
Maintaining business base and employment		
New business, increased employment		**TC 8 (THEMATIC OBJECTIVE 8): Promoting sustainable and quality employment and supporting labour mobility** Within this thematic objective EAFRD will primarily support micro enterprises and farms with sideline activities that will associate their development with the activation of endogenous potentials in rural areas, which means that they will primarily be engaged in the areas of wood processing, local self-sufficiency, green tourism, natural and cultural

heritage, management of organic waste, and renewables etc., which will provide the conditions for the creation of green jobs and an additional source of income on farms.

Agricultural and wood biomass are important sources of renewable energy and thus play an important role in tackling two of the key challenges the EU and national energy policy are confronted with. The potential to generate energy from renewable energy sources is high in Slovenia. This is particularly true of exploitation of wood biomass. EAFRD monies under this thematic objective will importantly contribute to the desired shift to a low-carbon economy, which is at the heart of the agenda under thematic objective 4.

RDP (Rural Development Programme) for the period 2014 – 2020

Measure M06: Development of farms and businesses (Article 19 of Regulation 1305/2013/EU) / Sub-Measure 6.4: Investments in the creation and development of non-agricultural activities

EXPECTED RESULTS: Preservation and creation of new jobs will be achieved throuhg the development of non-agricultural activities in rural areas, namely with adding value to the wood, treatment of organic waste and renewable energy, which will be primarily held for sale.

Measure M08 - Investments in forest area development and improvement of the viability of forests (Article 21-26 of Regulation 1305/2013/EU)

EXPECTED RESULTS: The measure is intended for sustainable development of forestry as an economic branch by promoting investments in forest technologies, mobilisation and non-industrial wood processing. These investments are of key importance for sustainable forest management, enhancement of forest-wood chains, increasing the added value of wood…and potential creation of new jobs.

Mitigation of climate change/adaptation to climate change	5	**Europe 2020 sustainable growth target**	**Current situation in Slovenia**	**National 2020 target in NRP**
		20% greenhouse gas (GHG) emissions reduction compared to	Emissions in non EU-ETS sector 11.5% (2012)	GHG emissions in the areas not part of the emissions trading with coupons

1990		(transport, agriculture, waste removal, households and services) may increase by 4 % by 2020 compared to 2005
20% share of energy from renewables in gross final energy consumption	20.2 % in 2012	Increase the share of renewables in gross final energy consumption to 25 %
20% increase in energy efficiency	Mid-term target for 2011 achieved: 4.9 % savings in energy end-use under Directive 2006/32/EC on energy end-use efficiency	Increase in efficient use of energy

TC 5 (THEMATIC OBJECTIVE 5): Promoting climate change adaptation and risk prevention and management

As far as agriculture is concerned and the EAFRD fund, the goal of delivering the environmental function of agriculture will be targeted with the 2014–2020 RDP measures. In particular, Agri-environment-climate measure will promote target-oriented introduction or further deployment of farming practices that contribute to the preservation of natural resources, biodiversity and the cultural landscape and its features as well as to mitigating climate change and adapting agriculture thereto.

RDP (Rural Development Programme) for the period 2014 – 2020

Environmental protection is included in the RDP 2014-2020 as a horizontal objective as it is applied to most of the measures of the Programme and therefore plays an important role. Key mechanisms are investments in mitigation and adaptation of

agricultural holdings (but also processing facilities) to climate change as well as area based payments to stimulate the environmental friendly agricultural practices (especially through the use of Agri-Environment-Climate Measure and Organic farming Measure). **These measures and others, mentioned in the continuation, are interlinked with several different thematic objectives under the Partnership agreement (not just thematic objective 5).**

The objective of reducing greenhouse gas and ammonium emissions in agriculture is intended to be pursued firstly as part of the **Investments in physical assets measure** (see Article 17 of Regulation 1305/2013/EU) within which investments in livestock agricultural holdings will contribute to more appropriate storage of manure, acquisition of biogas, purchase of special agricultural machinery for rational use of nitrogen, building of compost facilities, technological modernisation of stables and purchase of equipment for animal faeces, energy efficiency, etc.

A positive contribution to the aforementioned focus area is expected also through the **Agri-Environment-Climate Measure and Organic farming Measure** (Articles 28 and 29 of Regulation 1305/2013/EU (which are area related measures) within which more efficient nitrogen management will be promoted, which includes the type, quantity, time and manner of fertiliser application, fertilisation optimisation based on soil analysis, fertilisation plan, a suitable manner of tillage, selection of a suitable rotation crop with a sufficient share of legumes, etc. The latter measures, which are connected to the manner of tillage which increases the organic matter in soil, also have positive effects on the storing or binding of carbon in soil.

Both of these measures will be accompanied by **Knowledge transfer and Advisory services measures** (Articles 14 and 15 of Regulation 1305/2013/EU) which will be used to enhance the knowledge of farmers in the aforementioned respect. In addition**, cooperation projects** (cooperation among different actors) will be supported in the areas of climate change and environmental protection (Article 35 of Regula-

		tion 1305/2013/EU). The strategy of agriculture regulates measures for agriculture risk management in agriculture and are directed towards the adaptation of agricultural production to the anticipated effects of climate change, preventing and reducing the effects of natural disasters that occur as a result of unfavorable weather conditions and providing a stable income situation in agriculture. The introduction of modern technologies with the aim of reducing the effects of climate change;
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	5	**PA** **TC 6 (THEMATIC OBJECTIVE 6):** Preserving and protecting the environment and promoting resource efficiency **IE:** Protection and rehabilitation of biodiversity and soil, and promotion of ecosystem services, including the Natura 2000 network and green infrastructure. **Rationale:** A high proportion of Slovenia is included in the Natura 2000 network the management of which is not yet fully established. The conservation status of many habitats and species has rapidly deteriorated due to numerous pressures. Preserved biodiversity represents a potential for the development of the protected areas. **EXPECTED RESULTS:** A favourable conservation status of species and habitat types of European importance **RDP (Rural development Programme) for the period 2014 – 2020** Environmental Protection is included in the RDP as a horizontal objective and is applied to most of the measures of the Programme which could be assigned **to different thematic objectives under the Partnership agreement (not just PA TC 6 but also to TC 3, TC5).** **INVESTMENT MEASURES**: The measure “Investments in physical assets” directly contributes to this horizontal objective through anticipated investments in: • lower use of plant protection products (special machinery, arranging plantations of perennial plants, such as permanent plantations, tree nurseries, etc. which are resistant to diseases), purification and saving techniques on agricultural

holdings (rainwater, waste, etc.), adjusting to the special requirements of farming in environmentally vulnerable areas (e.g. water protection areas, Nitrates Directive, etc.), arranging permanent plantations and pastures (meadow orchards, extensive pastures, etc.), and implementing organic food production (sub-measure 4.1);

- arranging waste-water treatment plants, reducing emissions and saving water, arranging reservoirs for the collection of rainwater, and increasing the share of wood in building construction (sub-measure 4.2).
- Etc.

AGRI-ENVIRONMENT-CLIMATE MEASURE (Article 28 of Regulation 1305/2013/EU): The AEC measure contributes to the mitigation and adjustment to climate change and environmental protection through:

- the implementation of above standard technologies of production and breeding which reduce emissions of greenhouse gases and ammonia;
- suitable crop rotation and the selection of agricultural plant varieties;
- suitable techniques of land treatment and crop care which are primarily aimed at improving water retention in soil and soil fertility, and reducing the loss of soil carbon;
- sowing of drought-tolerant agricultural plants;
- breeding of autochthonous and traditional breeds of domestic animals, and the cultivation of autochthonous and traditional agricultural plant varieties adapted to local growing conditions;
- responsible handling of fertilisers and plant protection products, and their scientifically justified use;
- rational fertilisation of agricultural plants with nitrogen in order to improve the efficiency of nitrogen circulation on farms, and reduce the need to administer nitrogen from mineral fertilisers and consequently, nitrous oxide emissions etc.

ORGANIC FARMING MEASURE (Article 29 of Regulation 1305/2013/EU): Organic farming significantly contributes to reduction of agricultural pollution of groundwater, since basic prohibitions, such as the prohibition to use synthetic substances for plant protection (herbicides and other plant protection products) and readily soluble mineral fertilisers, directly result in active protection of groundwater against pollution with pesticide and partially also nitrate residues.

OTHER MEASURES such as Cooperation, Knowledge transfer, Advisory Services (previously mentioned) all stimulate environmental efficiency in agricultural sector, pro-

		cessing and forestry sector. Following the Strategy of Agriculture, the support for agricultural development will be oriented in restructuring, with the aim of increasing productivity and sustainable use of natural resources while considering the harmful emissions to the environment as well as mitigation and adaptation to climate change.
Resource efficient economy (reduction of waste, use of residues)	1	**PA** **TC 3:** Enhancing the competitiveness of small and medium-sized enterprises. **IE:** Support will also be given to ecoinnovations, smart energy and contribution of energy efficiency to the competitivness of SMEs. With reference to RDP 2014-2020 and this thematic objective, the aforementioned Measure “Investments in physical assets” will be used as the main tool to enhance resource efficiency in agriculture and food processing. **TC 6:** Preserving and protecting the environment and promoting resource efficiency **IE:** Addressing significant investment needs in the waste sector to fulfil environmental legislation requirements. **Rationale:** Most of the waste is still landfilled. The NRP envisages measures to establish adequate waste management infrastructure. The implementation of measures to prevent waste production and achieve the objectives of their recovery and reuse is an opportunity for development. **EXPECTED RESULTS:** Reduction of waste deposited **RDP (Rural development Programme) for the period 2014 – 2020** As far as RDP 2014-2020 is concerned, all previously mentioned measures can be taken into consideration (see in particular measure M04: Investments in physical assets, which aims at facilitating the supply and use of renewable energy sources, by-products, waste and residues, and other non-food products for bio-economy, as well as Measure M06: Development of farms and businesses / sub-Measure 6.4: Investments in the creation and development of non-agricultural activities where amongts others transition to greater resource efficiency will be stimulated).

Societal demand		
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bio-economy strategy ?	No	Name of the strategyLink:
Ministry(ies) in charge of the Bioe-conomy strategy ?	Yes / No	Name of the responsible Ministry: Ministry of Agriculture and Environment Link: http://www.mko.gov.si/si/ Name of the Strategy of Agriculture: Strategy for the implementation of the resolution on the strategic direction of de-velopment of Slovenian agriculture and agri-food sectors by 2020 Link: http://www.mko.gov.si/fileadmin/mko.gov.si/pageuploads/podrocja/Kmetijstvo/strategija_razvoj_slo_kmetijstva_2020.pdf Name of the responsible Ministry:Ministry of Infrastructure and Spatial Planning Link: Name of the strategy: National renewable energy action plan Link: http://www.energetika-portal.si/dokumenti/strateski-razvojni-dokumenti/akcijski-nacrt-za-obnovljivo-energijo/ http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/AN_OVE/AN-OVE_eng.pdf
Does your country have a Bioeconomy advisory body/panel ?	No	Name of the body: Link:
Does your country have a Bioeconomy agency or agencies ?	No	Name of the agency: Link:
Does your country have a Bioeconomy observatory collect-ing data/info ?	No	Name of the body: Link:
Does your country have a Bioeconomy National Contact point ?	No	Name: Contact:

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[87]
Agriculture	Yes	The Strategy of Agriculture for the implementation of the resolution on the strategic direction of development of Slovenian agriculture and food industry in 2020 Ensuring food security through stable production of safe, quality and affordable food to the consumer; increasing the competitiveness of the agriculture and food; sustainable use of production potential and providing agriculture-related public goods and ensure a coherent and socially sustainable rural development.	http://www.mko.gov.si/fileadmin/mko.gov.si/pageu-ploads/podrocja/Kmetijstvo/strategija_razvoj_slo_kmetijstva_2020.pdf English link is not available
Forestry	Yes	Resolution on National Forest Programme - includes goals, objectives and guidelines for use of wood and wood products in construction and residential environment. Wood and wood products should become the leading material; higher share of use of wood in primary energy balance should be attained. Governmental decree on green public procurement includes the requirements for at least 30% of wood or wood derived products shall be used by building and constructing of public buildings (without furnishing and the ground floor and lower constructions). By procurement of furniture at least 70% of wood or wood derived products are required.	http://www.uradni-list.si/1/objava.jsp?urlid=2007111&stevilka=5510 English link is not available http://www.pisrs.si/Pis.web/pregledPredpisa?id=URED5194 English link is not available
Marine/Fisheries/Aquaculture	Yes / No		
Waste	Yes / No		
Agri-Food & Food security	Yes	Ensuring stable production and economic conditions for	http://www.mko.gov.si/fileadmin/mko.gov.si/pag

[87] Please provide English link (if available)

		agriculture, restructuring and increasing the competitiveness of agriculture and related industries; conservation of soil fertility and production potential of agricultural land; more efficient marketing organization of agriculture, strengthening agri-food chains; enhancing the provision of public goods in agriculture, environmental protection and conservation of the cultural landscape; socially sustainable and balanced development of rural areas; the increasing role of knowledge and its efficient transfer..	eu-ploads/podrocja/Kmetijstvo/strategija_razvoj_slo_kmetijstva_2020.pdf English link is not available
Food, Healthy diet	Yes / No		
Research & Innovation	Yes / No		
Green Growth Strategy	Yes, partially	Agricultural development will focus on restructuring in the direction of increasing productivity and sustainable use of natural resources while considering the harmful emissions to the environment as well as mitigation and adaptation to climate change	http://www.mko.gov.si/fileadmin/mko.gov.si/pag eu-ploads/podrocja/Kmetijstvo/strategija_razvoj_slo_kmetijstva_2020.pdf English link is not available
Blue Growth Strategy	Yes / No	-	
Energy, including Bioenergy	Yes	Agriculture will contribute to a reduction of greenhouse gas emissions by replacing fossil fuels with renewable energy sources (use of biogas from livestock manure and crop residues to produce electricity and thermal energy utilization of waste heat from the stables, harness the energy of the sun for drying, etc..). The objective of the CAP is to promote the use of agricultural biomass for energy purposes in a manner that will be favorable impact on employment and the development of supplementary activities on farms, while not compromising the safety of the food in Slovenia. Options for growing biofuel feedstocks represent also the degraded areas, where cultivation of food and live-stock feed is not possible for the safety reasons..	http://www.energetika-portal.si/fileadmin/dokumenti/publikacije/AN_OVE/AN-OVE_eng.pdf
Industry, Enterprise	Yes / No		
Environment (incl. resource efficiency, sustainability, water use)	Yes, partially	The Strategy of Agriculture directs the agricultural practice for a reduction of emissions of greenhouse gases and ammonia in particular by promoting efficient circulation of nitrogen and more efficient livestock production. There are above-standard agricultural practices aimed at improving	http://www.mko.gov.si/fileadmin/mko.gov.si/pag eu-ploads/podrocja/Kmetijstvo/strategija_razvoj_slo_kmetijstva_2020.pdf

		the efficiency of nitrogen fertilizers, reduction of methane emissions from livestock digestive system, improving the utilization of nitrogen in livestock reduction of emissions from livestock manure storage and reducing energy consumption Rational use of water is one of Slovenia's development priorities. The Strategy of Agriculture envisages the introduction of crops that are more resistant to drought, optimization of existing irrigation systems and water efficient., Takes into account the positions, policies, terms and conditions and protection objectives in the field of water protection, which ensures the maintenance or improvement of the chemical and quantitative status of groundwater water and chemical and ecological status of surface waters. With the aim of maintaining or improving the quality of soil and water, the Strategy of Agriculture gives direction to more nature friendly farming methods.	English link is not available
Eco-System Services	Yes / No		
Regional development and Smart Specialisation	Yes / No		
Education/Skills	Yes, partially	The Strategy of Agriculture provides integration and closer cooperation between all actors in the system of knowledge transfer and innovation. It is crucial to increase funding to strengthen targeted research to support the developmental needs of agriculture and the implementation of technical tasks in agriculture.	http://www.mko.gov.si/fileadmin/mko.gov.si/pageu-ploads/podrocja/Kmetijstvo/strategija_razvoj_slo_kmetijstva_2020.pdf English link is not available
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[88]	**Link**[89]

[88] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[89] Please provide English link (if available)

II Research & Development

Q 4: Which Bioeconomy related R&D programmes exist in your country ?

By type of activity	Programme name (please provide links)	Short description and relation with the Bioeconomy	National PublicFunding allocated to the programme (€ / year)
Agriculture	- **Target Research Programme (TRP) «Securing food for tomorrow»**	Target research programmes (referred to the Slovenian abbreviation of CRP) represent a system created in 2011 for inter-sectoral cooperation in planning and implementing networked R&D projects in Agriculture, forestry, food safety, fisheries and rural development. CRP is a form and method of implementation of the Resolution on the strategic direction of the development of Slovenian agriculture and agri-food sectors in 2020 - "Securing food for tomorrow" and the Research and Innovation Strategy of Slovenia and is designed as an instrument of integration of the country to meet its needs, the research community and the general public / users of the results in the specified priority topics. The purpose of the CRP is to ensure targeted research and decision support in the preparation, adoption and implementation of agricultural policy. The framework for the creation of the priority themes for the period 2011 to 2020 is: I. Food Safety in Slovenia Objective: Ensuring food security through stable production of safe, quality and affordable food to the consumer; II. Competitiveness of food production and renewable natural resources Objective: Increasing the competitiveness of agriculture, forestry, fisheries and food; III. Sustainable management of natural resources Objective: Sustainable use of production potentials and ensuring the agriculture forestry and fisheries-related public goods; IV. Rural Development Objective: Ensuring a coherent and socially sustainable rural development, based on strategic objectives of the development of agriculture, forestry, fisheries, food and rural areas.	TRP: 1.335.600 EUR/year
	- **Research programmes (RP)**		RP: 3.522.000 EUR/year

	- **Research projects (basic, applied and post-doctoral)**	**Research programmes**[i] are a **public service** which shall represent an area of research, which is relevant and useful for a longer period of time and which is of such importance for Slovenia that there is national interest, as defined in the National Research and Development Programme, for long-term research by the programme group in this area. A **basic project** covers experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view. An **applied project** is also original investigation undertaken in order to acquire new knowledge. It is however, directed towards a specific practical aim or objective. Applied research may include industrial research. Industrial project is planned research or critical testing to acquire new knowledge with the aim of using that knowledge in the development of new products, processes or services or in the implementation of significant improvements in existing products, processes

		or services. A **post-doctoral project** may be a basic or applied research activity implemented so that a researcher can acquire additional post-doctoral experiences and knowledge and also provides additional training for Slovenians without Slovenian citizenship who are returning to Slovenia.	
Forestry	- **Target Research Programme (TRP) «Securing food for tomorrow»** - **Research programmes (RP)** - **Research projects (basic, applied and post-doctoral)**	**(See Agriculture)** **Research programmes**[ii] are a **public service** which shall represent an area of research, which is relevant and useful for a longer period of time and which is of such importance for Slovenia that there is national interest, as defined in the National Research and Development Programme, for long-term research by the programme group in this area.	TRP: 472.000 EUR/year RP: 404.124 EUR/year

		A **basic project** covers experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view. An **applied project** is also original investigation undertaken in order to acquire new knowledge. It is however, directed towards a specific practical aim or objective. Applied research may include industrial research. Industrial project is planned research or critical testing to acquire new knowledge with the aim of using that knowledge in the development of new products, processes or services or in the implementation of significant improvements in existing products, processes or services. A **post-doctoral project** may be a basic or applied research activity implemented so that a researcher can acquire additional post-doctoral experiences and knowledge and also provides additional training for Slovenians without Slovenian citizenship who are returning to Slovenia.	
Marine/Fisheries/Aquaculture	- **Target Research Programme (TRP) «Securing food for tomorrow»** - **Research programmes (RP)**	**(See Agriculture)**	TRP: 50.000 EUR/year RP: -

	- Research projects (basic, applied and post-doctoral)	**Research programmes** are a **public service** which shall represent an area of research, which is relevant and useful for a longer period of time and which is of such importance for Slovenia that there is national interest, as defined in the National Research and Development Programme, for long-term research by the programme group in this area. A **basic project** covers experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view. An **applied project** is also original investigation undertaken in order to acquire new knowledge. It is however, directed towards a specific practical aim or objective. Applied research may include industrial research. Industrial project is planned research or critical testing to acquire new knowledge with the aim of using that knowledge in the development of new products, processes or services or in the implementation of significant improvements in existing products, processes or services. A **post-doctoral project** may be a basic or applied research activity implemented so that a researcher can acquire additional post-doctoral experiences and knowledge and also provides additional training for

		Slovenians without Slovenian citizenship who are returning to Slovenia.	
Waste as Biomass source			
Food/feed use of biomass (food/feed value chains)			
Energy use of biomass (bioenergy)			
Industrial uses of biomass – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	- **Research programmes (RP)**	**Research programmes**[iii] are a **public service** which shall represent an area of research, which is relevant and useful for a longer period of time and which is of such importance for Slovenia that there is national interest, as defined in the National Research and Development Programme, for long-term research by the programme group in this area.	RP: 427.800 EUR/year
Key Enabling Technology (Industrial Biotechnology)			
Communication, stakeholder involvement			
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

II Research & Development Q 6: Potential benefit of European research cooperation			
	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions			
Resource efficiency			
Renewable resources/ bio-based products			
Knowledge transfer and good practice and innovation			
Economic/ market framework			
Policy framework			
Healthy food research			
Bioenergy			
Animal feed			
Development of an agreed methodology for environmental footprints			
Biorefineries			
Food security			
Social inclusion			
Algae			
Genetics			
Other areas, please specify Organic food and farming systems	5	Era NET Core Organic I, II, Plus	

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

SCAR
Standing Committee on Agricultural Research

Strategic Working Group on Biomass

Joint Survey on National Bioeconomy Strategies

TR - TURKEY

Country:	
Year of data collection:	2014
Contact mail person in charge of data collection:	Süveyla YILMAZ

This survey consist of two parts. It is aimed to collect data on:
(1) National Bioeconomy Policies and
(2) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

- Definition of Bioeconomy in Turkey
  - as a part of green economy, sustainable management and use of renewable natural resources as well as production based on them, utilisation of biological processes in production (biotechnology) and related expertise
- Background
  - the current governmental programme
  - update (strategic plan, 2013-2017) of national strategy on natural resources
- Motivation of the strategy
  - to facilitate Bioeconomy, especially new business, and remove barriers
  - to identify key areas in Bioeconomy for Turkey and define related directions for R&D and expertise needs for education
- Expected impact is
  - to generate new business and improve employment by developing new products and services based on renewable natural resources
  - to implement environmental targets

Please describe where your country's definition is different from the EU definition of the bioeconomy.[90]

[90] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Contribution/implementation of the EU strategy on Bioeconomy	2	
Food security/ land-use competition	5	
Healthy diet	4	
Independence from fossil resources/security of supply	3	
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)	4	
Development of new bioeconomy sectors (bioenergy, industrial biobased products)	3	
Maintaining business base and employment	3	
New business, increased employment	3	
Mitigation of climate change/adaptation to climate change	4	
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)	5	
Resource efficient economy (reduction of waste, use of residues)	4	
Societal demand	5	
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy ?	Yes / No No	Name of the strategy: "information not available" Link:
Ministry(ies) in charge of the Bioeconomy strategy ?	Yes / No Yes	Name of the responsible Ministry/ Ministries: The Ministry of Food, Agriculture and Livestock/General Directorate of Agricultural Research and Policies Link: http://www.tagem.gov.tr "information not available" Ministry Of Forestry and Water Affairs Link: http://www.ormansu.gov.tr "information not available" Ministry Of Environment and Planning Link: http://www.csb.gov.tr "information not available"
Does your country have a Bioeconomy advisory body/panel ?	Yes / No No	Name of the body: "information not available" Link:
Does your country have a Bioeconomy agency or agencies ?	Yes / No No	Name of the agency: Department of Agricultural Economics and Policy Research Link: http://www.tagem.gov.tr "information not available"
Does your country have a Bioeconomy observatory collecting data/info ?	Yes / No Yes	Name of the agency: Department of Agricultural Economics and Policy Research Link: http://www.tagem.gov.tr "information not available"
Does your country have a Bioeconomy National Contact point ?	Yes / No Yes	Name: Süveyla YILMAZ Contact: syılmaz@tagem.gov.tr

Bioeconomy related policies	Is a policy initiative for this area/sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[91]

[91] Please provide English link (if available)

Agriculture	Yes	1-Energy Plants Research Centre-Samsun 2-Central Laboratory of Medicinal Aromatic Plants-Antalya 3-Plant Biotechnology Testing Laboratories-Ankara	http://arastirma.tarim.gov.tr/ktae/Sayfalar/AnaSayfa.aspx http://arastirma.tarim.gov.tr/batem http://arastirma.tarim.gov.tr/tarlabitkileri
Forestry	Yes	1- In order to create the most added value of non-wood forest products, Product development projects are under-taken together with our universities. 2- New Product Development Project by diagnosis of active ingredients of non-wood forest products	http://www.ormansu.gov.tr/osb/
Marine/Fisheries/Aquaculture	No		
Waste	Yes	Activities of Ministries, Municipalities, Private Sector	“information not available”
Agri-Food & Food security	Yes		information not available”
Food, Healthy diet	Yes / No		information not available”
Research & Innovation	Yes / No		information not available”
Green Growth Strategy	Yes / No		information not available”
Blue Growth Strategy	Yes / No		information not available”
Energy, including Bioenergy	Yes / No		information not available”
Industry, Enterprise	Yes / No		information not available”
Environment (incl. resource efficiency, sustainability, water use)	Yes / No		information not available”
Eco-System Services	Yes / No		information not available”
Regional development and Smart Specialisation	Yes / No		information not available”
Education/Skills	Yes / No		information not available”
Other areas, please specify	No		

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[92]	**Link**[93]

[92] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[93] Please provide English link (if available)

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	http://www.tarim.gov.tr/TAGEM/Sayfalar/EN/AnaSayfa.aspx	To develop new knowledge and technologies in the agricultural sector	About 70 million €/year
Forestry	"information not available"		
Marine/Fisheries/Aquaculture	"information not available		
Waste as Biomass source	"information not available"		
Food/feed use of biomass (food/feed value chains)	"information not available"		
Energy use of biomass (bioenergy)	"information not available"		
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	"information not available"		
Key Enabling Technology (Industrial Biotechnology)	"information not available"		
Communication, stakeholder involvement	"information not available"		
Other areas, please specify	"information not available"		

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

"information not available"

II Research & Development Q 6: Potential benefit of European research cooperation			
	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specifiy.	**Comment/specification**
Common sustainability criteria/ GHG emmissions			
Resource efficiency	5	"Coordination of Agricultural Research in the Mediterranean (ERA-NET)"	
Renewable resources/ bio-based products			
Knowledge transfer and good practice and innovation	4	"Coordination of European Research within ICT and Robotics in Agriculture and Related Environmental Issues (ERA-NET) "	
Economic/ market framework	5	AGroFOod clusters platform with common long-term Research and Innovation Strategy towards Economic growth and prosperity (Regions of knowledge)	
Policy framework	4	"The Agricultural research for development dimension of the European Research Area (ERA-NET) "	
Healthy food research	5	Coordination of Europen Transnational research in Organic Food and Farming Systems Plus	
Bioenergy			
Animal feed			
Development of an agreed methodology for environmental footprints			
Biorefineries			
Food security	5	Sustainable Food Production and Consumption	
Social inclusion	4	Facing sustainability: new relationships between rural areas and agriculture in Europe (ERA-NET)	
Algae			
Genetics	5	Cooperation and shared strategies for biodiversity research programmes	

		in Europe	
Other areas, please specify			

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE

SCAR
Standing Committee on Agricultural Research

Strategic Working Group on Biomass

Joint Survey on National Bioeconomy Strategies

UK - UNITED KINGDOM

Country:	**United Kingdom**
Year of data collection:	**2014**
Contact mail person in charge of data collection:	**mike.collins@defra.gsi.gov.uk**

This survey consist of two parts. It is aimed to collect data on:

(1) National Bioeconomy Policies and

(2) National Bioeconomy Research & Development

I POLICY

Q 1: Does your country have a national definition for Bioeconomy? If so, please provide definition here

Please describe where your country's definition is different from the EU definition of the bioeconomy.[94]

The UK does not have a national definition for the Bioeconomy but the general understanding of the term is in-line with that defined by the European Commission below. Different sectors may focus on different aspects, for example, in the UK Bioenergy Strategy (2012) the term bioeconomy refers to "the set of economic activities relating to the invention, development, production and use of biological products and processes". While the House of Lords Science and Technology Select Committee Report "*Waste or resource? Stimulating a bioeconomy*" (2014) uses the term to describe the "use of biological feedstocks or processes involving biotechnology , to generate economic outputs in the form of energy, materials or chemicals". But this is no different to elsewhere in Europe and, as the latter report also points out, the term bioeconomy has been widely used in international policy and has been defined in several different ways [OECD (2009) The Bioeconomy to 2030: Designing a Policy Agenda; European Commission (2013) Innovating for Sustainable Growth: A Bioeconomy for Europe; The Whitehouse (2012) National Bioeconomy Blueprint; Federal Ministry for Research and Education (2011) National Research Strategy Bioeconomy 2030; Schmid et al. (2012) 'The Bio-Economy Concept and Knowledge Base in a Public Goods and Farmer Perspective'. Bio-based and Applied Economics 1(1): 47–63.]

[94] EU definition: 'The bioeconomy encompasses the production of renewable biological resources and their conversion into food, feed, bio-based products and bioenergy. It includes agriculture, forestry, fisheries, food and pulp and paper production, as well as parts of chemical, biotechnological and energy industries. Its sectors have a strong innovation potential due to their use of a wide range of sciences (life sciences, agronomy, ecology, food science and social sciences), enabling and industrial technologies (biotechnology, nanotechnology, information and communication technologies (ICT), and engineering), and local and tacit knowledge' *Source:* Commission Staff Working Document of COM(2012) 60 final. Innovation for Sustainable Growth. A Bioeconomy for Europe.

I POLICY Q 2: Please list the main drivers for your country to engage in the development of the Bioeconomy		
	Please insert priority ranging from 5 (= high) to 1 (= low)	Comment/specification
Comment: Most of the drivers are recognised as being of high importance by the UK though for different organisations their importance as drivers for engagement may vary depending on an individual organisation's objectives/remit.		
Contribution/implementation of the EU strategy on Bioeconomy		
Food security/ land-use competition		
Healthy diet		
Independence from fossil resources/security of supply		
Development of classic bioeconomy sectors (agriculture, forestry, fisheries, food, paper)		
Development of new bioeconomy sectors (bioenergy, industrial biobased products)		
Maintaining business base and employment		
New business, increased employment		
Mitigation of climate change/adaptation to climate change		
Environmental protection/ environmental sustainability (i.e. biodiversity and ecological services)		
Resource efficient economy (reduction of waste, use of residues)		
Societal demand		
Other drivers – please specify		

I POLICY Q 3: Please list National policy strategies which would also cover the Bioeconomy at least partly		
Does your country have a National Bioeconomy strategy?	No	There is no single UK national strategy for the bioeconomy.
Ministry(ies) in charge of the Bioeconomy strategy?	No	There is no single Bioeconomy strategy. However the following Ministries have responsibility for different aspects of this area: o Department for Environment, Food and Rural Affairs (Defra) (www.gov.uk/defra) o Department of Energy and Climate Change (DECC) (www.gov.uk/decc) o Department for Business, Innovation and Skills (BIS) (www.gov.uk/bis) o Department for Transport (DfT) (www.gov.uk/dft) o Department for International Development (DFID) (www.gov.uk/dfid) o Food Standards Agency (FSA) (www.food.gov.uk) o Devolved Administrations: - Scottish Government (www.scotland.gov.uk) - Welsh Government (www.wales.gov.uk) - Northern Ireland Executive (www.northernireland.gov.uk)
Does your country have a Bioeconomy advisory body/panel?	No	However, Innovate UK (formerly the Technology Strategy Board) has an Industrial Biotechnology Leadership Forum that undertakes part of this role (https://connect.innovateuk.org/web/industrial-biotechnology). There are also a variety of other bodies in government departments and the Research Councils which provide an advisory role, such as: o the Leadership Council which is supporting delivery of the UK Agri-Tech Strategy (www.gov.uk/government/publications/uk-agricultural-technologies-strategy) and o Defra's Science Advisory Council, which provides expert independent advice on science policy and strategy (www.gov.uk/government/organisations/science-advisory-council. The above a just two examples of a range of advisory bodies/committees on research and other activities.
Does your country have a Bioeconomy agency or agencies?	No	Not specifically a "Bioeconomy agency" but bodies addressing different aspect of the bioeconomy. Many of the following have produced strategy related documents and reports: o Technology Strategy Board (TSB), including its Knowledge Transfer Network Ltd (www.innovateuk.org/food;jsessionid=D2DB9B3D11222FA447DFEA151517628F.1#act

		ion) o Forestry Commission (www.forestry.gov.uk/forestresearch) o Energy Technologies Institute (ETI) (www.eti.co.uk/category/available-materials/?restrict=brochures) o Energy Research Partnership (www.energyresearchpartnership.org.uk/page12) o UK Energy Research Centre (www.ukerc.ac.uk) o National Farmers Union (www.nfuonline.com/science-environment/science/) o National Non-Food Crops Centre (NNFCC) (www.nnfcc.co.uk/publications) o Research Councils: - Biotechnology and Biological Sciences Research Council (BBSRC) (www.bbsrc.ac.uk/publications/publications-index.aspx) - Natural Environment Research Council (NERC) (www.nerc.ac.uk/latest/publications/) - Engineering and Physical Sciences Research Council (EPSRC) (www.epsrc.ac.uk/newsevents/pubs/) - Economic and Social Research Council (ESRC) (www.esrc.ac.uk/news-and-events/publications/index.aspx)
Does your country have a Bioeconomy observatory collecting data/ info?	No	Name of the body: Link:
Does your country have a Bioeconomy National Contact Point?	No	There is no NCP specific to the Bioeconomy. "Innovate UK" (formerly the Technology Strategy Board) provides the NCPs for Horizon 2020 including that for the Societal Challenge 2. Web: https://www.h2020uk.org/home

Bioeconomy related policies	Is a policy initiative for this area/ sector available?	If yes, please elaborate on how the Bioeconomy is covered in this policy initiative	Link for download[95]
Comment: The information below in not restricted to policy initiatives but includes a range of activities of relevance to the bioeconomy. Some are relevant to more than one policy area and there is overlap between areas e.g. between "Environment" and "Ecosystem services"			
Agriculture	Yes	1) The EU's Common Agricultural Policy. Each part of the UK has different arrangements for this. The weblink provides access to information in Scotland, Wales and Northern Ireland. The second link to more information on schemes and the policy background for England. 2) **UK Cross-Government Food Research and Innovation Strategy** (2010) provides an overarching government framework to facilitate a more coordinated approach to food research and innovation across the UK. 3) **Foresight Report on the Future of Food and Farming** (2011) explores the pressures on the global food system between now and 2050. It identifies the decisions that policy makers need to take to ensure that a global population rising to 9 billion or more can be fed in a fair and sustainable way. 4) **UK Global Food Security Strategic Plan 2011-16** (updated 2013) provides a focus on where the partners in the UK Global Food Security Programme can catalyse new activity, through co-ordination and interdisciplinary research, to stimulate innovation that will support resilience of both the UK and global food supply chain.	1) https://www.gov.uk/government/policies/reforming-the-common-agricultural-policy-to-ensure-a-fair-deal-for-farmers-consumers-and-taxpayers https://www.gov.uk/government/collections/common-agricultural-policy-reform 2) http://www.bis.gov.uk/assets/goscience/docs/c/cross-government-food-research-strategy.pdf 3) http://www.bis.gov.uk/assets/foresight/docs/food-and-farming/11-546-future-of-food-and-farming-report.pdf 4) http://www.foodsecurity.ac.uk/assets/pdfs/gfs-strategic-plan.pdf 5) http://www.official-documents.gov.uk/document/cm80/8082/8082.pdf 6) https://www.gov.uk/government/publications/uk-agricultural-technologies-strategy 7) https://www.gov.uk/government/publications/green-food-project-conclusions 8) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69488/p

[95] Please provide English link (if available)

		5) **Defra Natural Environment White Paper "The Natural Choice – securing the value of nature"** (2011) outlines the Government's vision for the natural environment (including forests and farmed land) over the next 50 years, along with practical action to deliver that ambition. 6) **UK Strategy for Agricultural Technologies** (2013) sets the framework for encouraging the adoption of new technologies in the agricultural sector to improve competitiveness and stimulate rural economic growth. 7) **Defra Green Food Project** (2012) a joint initiative between Government, the food and farming industry, environmental and consumer organisations to reconcile how the goals of improving the environment and increasing food production in England can be achieved. 8) **Food and Drink Action Plan** (2012) to drive export growth in the farming, food and drink sector.	b13702-food-export-actionplan.pdf
Forestry	Yes	1) **Defra Natural Environment White Paper "The Natural Choice – securing the value of nature"** (2011) outlines the Government's vision for the natural environment (including forests and farmed land) over the next 50 years, along with practical action to deliver that ambition. 2) **Government Forestry and Woodlands Policy Statement** (2013) sets out priorities for future Government policy-making in England to protect, improve and expand public and private woodlands, including woodland creation and management, economic development of the forestry sector and tree health. 3) **Forestry Commission Science and Innovation Strategy for Forestry in Great Britain** (2014) sets out how its research programmes	1) http://www.official-documents.gov.uk/document/cm80/8082/8082.pdf 2) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/221023/pb13871-forestry-policy-statement.pdf 3) http://www.forestry.gov.uk/pdf/FCFC002.pdf/$FILE/FCFC002.pdf 4) http://scotland.forestry.gov.uk/supporting/strategy-policy-guidance/forestry-strategy

		are determined and how they are linked to national forestry strategies and wider government policy. 4) **The Scottish Forestry Strategy** (2006) sets a vision for the second half of the 21st century, while focussing on key priorities to 2020.	
Marine/Fisheries/Aquaculture	Yes	1) **UK Government High-level Marine Objectives 'Our Seas, a shared resource'** (2009) sets out the UK vision of having *'clean, healthy, safe, productive and biologically diverse oceans and seas'.* 2) **Fisheries 2027** (2007) Defra's long-term vision for sustainable fisheries. 3) **UK Marine Science Strategy 2010-25** establishes a strategic framework for shaping, supporting, co-ordinating and enabling the delivery of world class marine science for the UK. It will help to produce the portfolio of evidence needed to achieve the UK vision of having *'clean, healthy, safe, productive and biologically diverse oceans and seas'.* 4) **UK Marine Policy Statement** (2011) facilitates and supports the formulation of Marine Plans, ensuring that marine resources are used in a sustainable way in line with UK high level marine objectives.	1) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/182486/ourseas-2009update.pdf 2) https://www.gov.uk/government/publications/fisheries-2027-a-long-term-vision-for-sustainable-fisheries 3) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/183310/mscc-strategy.pdf 4) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf
Waste	Yes	1) **Government Review of Waste Policy in England 2011** sets out actions and commitments to a zero waste economy in England. Identifies food waste as a priority for action. 2) **Scotland's Zero Waste Plan** (2010) sets out actions and commitments to a zero waste economy in Scotland. 3) **Wales' Towards Zero Waste** (2010) sets out actions and commitments to a zero waste economy in Wales. 4) **Northern Ireland's Delivering Resource**	1) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69401/pb13540-waste-policy-review110614.pdf 2) http://www.scotland.gov.uk/Resource/Doc/314168/0099749.pdf. 3) http://wales.gov.uk/docs/desh/publications/100621wastetowardszeroen.pdf. 4) http://www.doeni.gov.uk/wms_2013.pdf. 5) http://www.publications.parliament.uk/pa/ld201314/ldselect/ldsctech/141/141.pdf

		Efficiency (2013) sets the policy framework for the management of waste in Northern Ireland. 5) **House of Lords Science and Technology Select Committee Report 2014 "Waste or resource? Stimulating a bioeconomy"** investigated the science and technology underpinning the transformation of carbon-containing waste into useful and high value products, and assessed the economic and environmental opportunities for the UK, the potential scale of this bioeconomy and the role of Government.	
Agri-Food & Food Security	Yes	1) **UK Cross-Government Food Research and Innovation Strategy** (2010) provides an overarching government framework to facilitate a more coordinated approach to food research and innovation across the UK. 2) **Foresight Report on the Future of Food and Farming** (2011) explores the pressures on the global food system between now and 2050. It identifies the decisions that policy makers need to take to ensure that a global population rising to 9 billion or more can be fed in a fair and sustainable way. 3) **UK Global Food Security Strategic Plan 2011-16** (updated 2013) provides a focus on where the partners in the UK Global Food Security Programme can catalyse new activity, through co-ordination and interdisciplinary research, to stimulate innovation that will support resilience of both the UK and global food supply chain. 4) **UK Strategy for Agricultural Technologies** (2013) sets the framework for encouraging the adoption of new technologies in the agricultural sector to improve competitiveness and stimulate rural economic growth. 5) **Protecting Plant Health: A Plant Biosecuri-**	1) http://www.bis.gov.uk/assets/goscience/docs/c/cross-government-food-research-strategy.pdf 2) http://www.bis.gov.uk/assets/foresight/docs/food-and-farming/11-546-future-of-food-and-farming-report.pdf 3) http://www.foodsecurity.ac.uk/assets/pdfs/gfs-strategic-plan.pdf 4) https://www.gov.uk/government/publications/uk-agricultural-technologies-strategy 5) https://www.gov.uk/government/publications/plant-biosecurity-strategy-for-great-britain

		ty Strategy for Great Britain (2014) provides a high-level overview of government activity to improve plant biosecurity.	
Food, Healthy diet	Yes	1) **Foresight Report on Tackling Obesities: Future Choices** (2007) takes a strategic 40 year forward look at how the UK can respond sustainably to rising levels of obesity. 2) **Department of Health's Healthy Lives, Health People: A Call to Action on Obesity in England** (2011) 3) **Food Standards Agency Strategy** (2009-15) sets out objectives of safer food for the nation and the outcomes and priorities to achieve this. 4) **Scottish Government Food and Drink Policy 'Recipe for Success'** (2009) promotes sustainable economic growth in Scotland while recognising the challenges of public health, environmental sustainability and affordability.	1) https://www.gov.uk/government/publications/reducing-obesity-future-choices 2) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/213720/dh_130487.pdf 3) http://collections.europarchive.org/tna/20130413013629/http://food.gov.uk/multimedia/pdfs/strategy20102015.pdf 4) http://www.scotland.gov.uk/Publications/2009/06/25133322/0
Research & Innovation	Yes	1) **BIS Innovation and Research Strategy for Growth** (2011) sets out how Government will work with business and the knowledge base to underpin private sector led growth. Includes support to industrial biotechnology and agri-food business. 2) **Defra: Making the most of our evidence: A strategy for Defra and its network** (2014) sets out how Defra's evidence needs will be prioritised to help grow the rural economy, improve the environment and safeguard animal and plant health. 3) **DECC Science and Innovation Strategy 2012** sets out DECC's priorities to be delivered between 2011-15 including bioenergy. 4) **Developing DECC's Evidence Base** (2014) builds on DECC's Science and Innovation	1) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32450/11-1387-innovation-and-research-strategy-for-growth.pdf 2) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/318610/evidence-strategy-defra.pdf 3) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48335/5107-decc-science-innovation-strategy-2012.pdf 4) https://www.gov.uk/government/publications/developing-deccs-evidence-base 5) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/67757/research-strategy-08.pdf 6) http://multimedia.food.gov.uk/multimedia/pd

		Strategy and sets out, for the first time, priority interests for developing evidence to underpin policy development , including low carbon energy. 5) **DFID Research Strategy 2008-13** sets out how the UK will invest in research to reduce poverty in developing countries. 6) **FSA Science and Evidence Strategy 2010-15** (refresh 2013) sets out how the UK will use science and evidence to deliver safer food for the nation. 7) **BBSRC The Age of Bioscience Strategic Plan** (refresh 2013/14) sets out a vision to lead world-class 21st century bioscience, promoting innovation in the bioeconomy, and realising benefits for society within and beyond the UK. 8) **NERC The Business of the Environment** (2013) sets out NERC's strategic direction to shape and deliver the UK's environmental research and innovation ambitions.	fs/scistrat.pdf 7) http://www.bbsrc.ac.uk/web/FILES/Publications/strategic-plan.pdf 8) http://www.nerc.ac.uk/latest/publications/strategycorporate/strategy/the-business-of-the-environment.pdf
Green Growth Strategy	Yes	1) **BIS Industrial Strategy** (2013) is a long-term, whole-of-government approach to support economic growth. Has five main strands including investment in the eight great technologies where the UK has the research expertise and business capability to become a world leader, including life sciences and agri-science. 2) **Enabling the transition to a green economy** (2011) sets out Government's vision and roadmap for the transition to a green economy. 3) **Scottish Government Economic Strategy** (2011) identifies six strategic priorities to accelerate recovery, drive sustainable economic growth and develop a more resilient and adaptable economy in Scotland.	1) https://www.gov.uk/government/collections/industrial-strategy-government-and-industry-in-partnership (links to all supporting Strategy documents, including the Life Sciences Strategy) 2) https://www.gov.uk/government/publications/enabling-the-transition-to-a-green-economy 3) http://www.scotland.gov.uk/Publications/2011/09/13091128/0

Blue Growth Strategy	Yes	1) **UK Government High-level Marine Objectives 'Our Seas, a shared resource'** (2009) sets out the UK vision of having *'clean, healthy, safe, productive and biologically diverse oceans and seas'.* 2) **UK Marine Policy Statement** (2011) facilitates and supports the formulation of Marine Plans, ensuring that marine resources are used in a sustainable way in line with UK high level marine objectives. 3) **UK Marine Strategy Part One** (2012) provides an initial assessment on the status of the UK's seas and targets/ indicators for good environmental status.	1) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/182486/ourseas-2009update.pdf 2) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69322/pb3654-marine-policy-statement-110316.pdf 3) https://www.gov.uk/government/publications/marine-strategy-part-one-uk-initial-assessment-and-good-environmental-status
Energy, including Bioenergy	Yes	1) **UK Bioenergy Strategy** (2012) sets out the Government's approach to achieving sustainable, low-carbon bioenergy deployment by defining a framework of principles that will govern future policies. 2) **DECC Community Energy Strategy** (2014) sets out the role that communities can play in helping to meet the UK's energy and climate change challenges, including supporting a sustainable and secure energy system and reducing UK greenhouse gas emissions. 3) **Defra Anaerobic Digestion Strategy and Action Plan for England** (2011) sets out the Government's commitment to increase the energy from waste produced through anaerobic digestion. 4) **Low Carbon Innovation Coordination Group Strategic Framework 2014** sets out priorities for future coordination of UK public-sector support to low carbon technology innovation, including bioenergy. 5) **Scottish Government 2020 Routemap for Renewable Energy in Scotland** (2011) up-	1) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/48337/5142-bioenergy-strategy-.pdf 2) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/275163/20140126Community_Energy_Strategy.pdf 3) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69400/anaerobic-digestion-strat-action-plan.pdf 4) http://www.lowcarboninnovation.co.uk/working_together/technology_focus_areas/bioenergy/ 5) http://www.scotland.gov.uk/Publications/2011/08/04110353/0

		dates and extends the Scottish Renewables Action Plan 2009. Includes a new target to meet an equivalent of 100% demand for electricity from renewable energy by 2020.	
Industry, Enterprise	Yes	1) **BIS Industrial Strategy** (2013) is a long-term, whole-of-government approach to support economic growth. Has five main strands including investment in the eight great technologies where the UK has the research expertise and business capability to become a world leader, including life sciences and agri-science. 2) **Scotland National Plan for Industrial Biotechnology** (2013) aims to transform the competitiveness and sustainability of industries in Scotland by developing and applying IB within the emerging bioeconomy, and to grow IB related turnover in Scotland to £900m by 2025. 3) **TSB Enabling Technologies Strategy 2012-15** aims to stimulate the development of enabling technologies, tools and approaches and the exploitation of new high-value products, services and systems based on them. Focuses on four areas including the Biosciences. 4) **TSB Concept to Commercialisation – A Strategy for Business Innovation 2011-15** sets out the role of the Technology Strategy Board in providing financial stimulus to support R&D and innovation as well as the importance of connecting the innovation landscape, including in sustainable agriculture and food.	1) https://www.gov.uk/government/collections/industrial-strategy-government-and-industry-in-partnership (links to all supporting Strategy documents, including the Life Sciences Strategy) 2) http://www.scottish-enterprise.presscentre.com/imagelibrary/downloadmedia.ashx?MediaDetailsID=1222&SizeId=-1 3) https://www.innovateuk.org/documents/1524978/2139688/Enabling+technologies+-+Strategy+2012-2015/c11ba6fd-435c-4230-a3ed-4b6c29f2582a 4) https://www.innovateuk.org/our-strategy
Environment (incl. resource efficiency, sustainability, water use)	Yes	1) **Making Space for Nature Review** (2010) an independent review of England's wildlife sites and ecological network that considered whether England's collection of wildlife areas represented a coherent and robust ecological network that would be capable of responding	1) https://www.gov.uk/government/publications/government-response-to-the-making-space-for-nature-review 2) http://www.official-documents.gov.uk/document/cm80/8082/8082.pdf

		to the challenges of climate change and other pressures. **2) Defra Natural Environment White Paper "The Natural Choice – securing the value of nature"** (2011) outlines the Government's vision for the natural environment (including forests and farmed land) over the next 50 years, along with practical action to deliver that ambition**.** 3) **Opportunities for UK Business that Value and/ or Protect Nature's Services Report** (2012) the final report of the "Review of UK National Ecosystem Assessment (NEA) Evidence to Assess Scope for Business Related Ecosystem Market Opportunities in the UK and Tools for Business Sector Uptake". Identifies opportunities for market potential such as woodland enhancement through markets for wood fuel. 4) **Scottish Government Rural Affairs and the Environment Strategic Research Strategy 2011-2016** supports delivery of the objectives of Scotland's Rural and Environment portfolio and is situated within the broader policy and economic context for Scotland, including its Government Economic Strategy and Science for Scotland. 5) Natural Capital Committee's second State of Nature Capital report (2014)	3) http://webarchive.nationalarchives.gov.uk/20130822084033/http://www.defra.gov.uk/ecosystem-markets/files/EMTF-VNN-STUDY-FINAL-REPORT-REV1-14.06.12.pdf 4) http://www.scotland.gov.uk/Resource/0044/00443642.pdf 5) https://www.naturalcapitalcommittee.org/
Eco-System Services	Yes	1) **UK National Ecosystem Assessment** (2011) provided the first analysis of the UK's natural environment in terms of the benefits it provides to society and continuing economic prosperity. A follow-on phase is further developing and promoting the arguments that the UK NEA put forward and make them applicable to decision and policy making at a range of spatial scales across the UK to a wide range of stakeholders. Interdiciplinary re-	1) http://uknea.unep-wcmc.org/ 2) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69446/pb13583-biodiversity-strategy-2020-111111.pdf 3) http://www.nerc-bess.net/ 4) http://www.scotland.gov.uk/Resource/0042/00425276.pdf

		search findings under this follow-on phase were released June 2014. 2) **Defra Biodiversity 2020: A strategy for England's wildlife and ecosystem services** (2011) builds on the Natural Environment White Paper and sets out the strategic direction for biodiversity policy for the next decade on land (including rivers and lakes) and at sea. 3) **Biodiversity and Ecosystem Service Sustainability (BESS) (2011-2017)** a NERC programme, supported by BBSRC, designed to answer fundamental questions about the functional role of biodiversity in key ecosystem processes and the delivery of ecosystem processes at the landscape scale. 4) **2020 Challenge for Scotland's Biodiversity** (2013) supplements the Scottish Biodiversity Strategy 2004.	
Regional Development and Smart Specialisation	Yes	1) **Government White Paper 'Local Growth: Realising Every Place's Potential'** (2010) sets out the government's role in supporting locally driven growth, encouraging business investment and promoting economic development through e.g. Local Enterprise Partnerships (https://www.gov.uk/government/policies/supporting-economic-growth-through-local-enterprise-partnerships-and-enterprise-zones/supporting-pages/local-enterprise-partnerships). 2) **Defra Rural Economy Growth Review** (2011) set out government measures, as part of the growth review, designed to stimulate sustainable growth in the rural economy and help businesses to reach their full potential. Measures included targeted funding under the Rural Development Programme for England (see 4 below), expanding the food and drink	1) https://www.gov.uk/government/publications/local-growth-realising-every-places-potential-hc-7961 2) https://www.gov.uk/government/publications/rural-economy-growth-review 3) https://www.gov.uk/government/collections/industrial-strategy-government-and-industry-in-partnership (links to all supporting Strategy documents, including the Life Sciences Strategy) 4) https://www.gov.uk/rural-development-programme-for-england

		sector, and delivering green growth (renewable energy, improving skills in the forestry sector). 3) **BIS Industrial Strategy** (2013) is a long-term, whole-of-government approach to support economic growth. Has five main strands including investment in the eight great technologies where the UK has the research expertise and business capability to become a world leader, including life sciences and agri-science. 4) **Rural Development Programme for England** grant schemes to improve rural life and businesses; promote environmentally friendly ways of managing land; and sustain existing and create new areas of woodlands. There are separate rural development programmes for Scotland, Wales and Northern Ireland.	
Education/Skills	Yes	1) **Food Research Partnership 'High-Level Skills for Food' Report** (2010) explored the main issues around high-level skills in the agriculture and food sectors, in particular the key opportunities and challenges, and identified priorities for action - focusing on high level (undergraduate) and very high (Masters and PhD level) skills. 2) **BIS Innovation and Research Strategy for Growth** (2011) sets out how Government will work with business and the knowledge base to underpin private sector led growth. 3) **Defra Future of Farming Review** (2013) examined the barriers and opportunities for new entrants entering and building successful careers in farming. 4) **UK Strategy for Agricultural Technologies** (2013) – see above.	1) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/283195/10-929-high-level-skills-for-food.pdf 2) https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/32450/11-1387-innovation-and-research-strategy-for-growth.pdf 3) https://www.gov.uk/government/publications/future-of-farming-review-2013-report 4) https://www.gov.uk/government/publications/uk-agricultural-technologies-strategy
Other areas, please specify			

Please list Bioeconomy regions and/or clusters in your country (if available)		
Name	**Description of the focus/specialisation**[96]	**Link**[97]
Enterprise Zones (England)	The UK government has created 24 **Enterprise Zones** in England that offer a range of incentives for businesses to start up or expand. Several are relevant to the bioeconomy sector with the following examples: • Alconbury Enterprise Campus - industrial biotechnology (http://www.alconbury-weald.co.uk/enterprise-campus). • Discovery Park – agri-food business, industrial biotechnology (http://www.discovery-park.co.uk/). • Hereford Enterprise Zone – agri-food business (http://www.skylonpark.co.uk/). • Humber Green Port Corridor – agri-food (http://enterprisezones.communities.gov.uk/enterprise-zone-finder/humber-green-port-corridor-enterprise-zone/). • Nottingham Enterprise Zone – industrial biotechnology (http://investinnottingham.com/enterprisezone.html).	http://enterprisezones.communities.gov.uk/
Science Parks (UK)	UK has approximately 110 **Science Parks**, which aim to facilitate the sharing of ideas, encourage and support the start-up and incubation of knowledge-based businesses, and provide links with centres of knowledge creation such as universities, higher education institutes and research organisations. Information about these, including sector coverage in the bioeconomy area, can be found through the UK Science Park Association website.	www.ukspa.org.uk/
	Some other clusters are set out below:	
Agri-Tech East (East of England)	A business-focused cluster that aims to improve the international competitiveness and sustainability of plant-based agriculture and horticulture.	www.agritech-east.co.uk
BioDundee (Scotland)	A public/ private partnership between the life sciences organisations within and around Dundee. Main research themes include agricultural biotechnology.	www.biodundee.co.uk
Biovale (Yorkshire and	Innovation cluster for the bioeconomy. Four focus areas: high-value chemicals from	www.biovale.org/

[96] 1= biomass supply; 2= food/feed use of biomass; 3= energy use of biomass/bioenergy ; 4= industrial use of biomass, biobased products
[97] Please provide English link (if available)

Humber)	plants and microbes; advanced biofuels and biorefineries; value from biowaste; agricultural technology.	
European Centre for Marine Biotechnology (Scotland)	Innovation cluster for new and emerging marine biotechnology companies.	www.ecmb.org/
Life Sciences Scotland	Sector activities include biotechnology.	www.lifesciencesscotland.com
North East of England Process Industry Cluster	Sectors covered include biotechnology, bioresources, biofuels and renewable energy and low carbon materials.	www.nepic.co.uk
Norwich Research Park (East Anglia)	A business community of research organisations. Sector activities focus is on food, health and the environment, including biotechnology, agricultural biotechnology and crop breeding.	www.norwichresearchpark.com
One Nucleus (Cambridge/ London)	Sector coverage include biotechnology.	www.onenucleus.com/
Oxfordshire Bioscience Network	Sector activities include biotechnology.	www.oxfordshirebioscience.net

II Research & Development Q 4: Which Bioeconomy related R&D programmes exist in your country ?			
By type of activity	**Programme name (please provide links)**	**Short description and relation with the Bioeconomy**	**National PublicFunding allocated to the programme (€ / year)**
Agriculture	1) **UK Global Food Security Programme** (http://www.foodsecurity.ac.uk). 2) **Agri-Tech Catalyst** (https://www.innovateuk.org/agri-tech-catalyst).	1) National public funding of agriculture and food R&D in the UK is devolved between the relevant government departments in England, Wales, Scotland and Northern Ireland. However, the **Global Food Security Programme**, a partnership of the main funders of research, helps to coordinate research in this area through themes set out in the Global Food Security Strategy (see Q3 above). The programme accounts for some £350 million of the total Government research spend, and supports a large portfolio of work which underpins food security, including programmes relating *inter alia* to plant, animal and microbial biology, biodiversity, ecosystem services, climate modelling, socio-economics and engineering. 2) The **Agri-Tech Catalyst** will invest **£70m**, co-funded with industry, to help new agricultural technologies to bridge the gap between the laboratory and the market place. It will fund proposals relating to primary crop and livestock production, including aquaculture; non-food uses of arable crops (e.g. biomass); food security and nutrition challenges in international development; and challenges in downstream food processing, provided the solution lies in primary production.	1) Total UK approx. £410m annually.
Forestry	1) **UK Forestry, Tree and Plant Health Science** (see description box).	1) National public funding of forestry, tree and plant health research in the UK is devolved between the relevant government departments in England, Wales, Scotland and Northern Ireland. See below for information about the major programmes in England and Scotland: **Defra Tree Health and Plant Biosecurity Research Programme** supports plant health policy including tree health and statutory plant health	1) Approx £5.6m p.a. (in England).

		(https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/221057/pb13929-evidenceplan-tree-health-plant-biosecurity.pdf). **Forestry Commission Research Programme** supports objectives of protecting and expanding forests and woodlands in England annd Scotland and increasing their value to society and the environment (http://www.forestry.gov.uk/forestry/infd-7unlr3) and (http://www.scotland.gov.uk/Topics/farmingrural/Rural/Forestry) .	
Marine/Fisheries/Aquaculture	1) **UK Marine Science** (see description box). 2) **Agri-Tech Catalyst** (see above).	1) The Government's **UK Marine Science Coordination Committee** (MSCC) drives forward the UK Marine Strategy and coordinates the marine science research funded by the government departments in England (see below for information about Defra's Marine Research Programme) and the Devolved Administrations in Wales, Scotland and Northern Ireland (https://www.gov.uk/government/groups/marine-science-co-ordination-committee). Key priorities are understanding how the marine ecosystem functions; responding to climate change and its interaction with the marine environment; and sustaining and increasing ecosystem benefits. **Defra Marine Research Programme**: Overall vision is to achieve clean, healthy, safe, productive and biologically diverse oceans and seas. Policy portfolio includes marine environment, marine biodiversity, and sustainable fisheries (https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/221067/pb13919-evidenceplan-marine-programme.pdf).	1) Total UK marine science funded by MSCC members £170.5m in 2012/13.
Waste as Biomass source	1) **Industrial Biotechnology Catalyst** (https://www.innovateuk.org/industrial-biotechnology-catalyst). 2) **BBSRC Integrated Biorefining Research and Technology Club (IBTI)**	1) The **IB Catalyst** will support businesses and researchers in developing innovative solutions to challenges in industrial biotechnology and bioenergy. It has **£45m** allocated for commitment in 2014, but **no dedicated pot to type of activity**. 2) The **IBTI** is a **£6m, 5-year programme** aimed at developing biological processes and feedstocks to reduce current dependence on fossil fuels as a source of chemicals , materials	

	(http://www.bbsrc.ac.uk/business/collaborative-research/industry-clubs/ibti/ibti-index.aspx).	and fuel. **Funds are not dedicated to type of activity**.	
Food/feed use of biomass (food/feed value chains)			
Energy use of biomass (bioenergy)	1) **Industrial Biotechnology Catalyst** (see above). 2) **Agri-Tech Catalyst** (see above).	1) See above. 2) See above.	
Industrial uses of biomass – **Paper and pulp production** – **Wood and products** – **Chemical production** – **Pharmaceutical production** – **Other industrial uses**	1) **Industrial Biotechnology Catalyst** (see above). 2) **BBSRC Integrated Biorefining Research and Technology Club (IBTI)** (see above).	1) See above. 2) See above.	
Key Enabling Technology (Industrial Biotechnology)	1) **Industrial Biotechnology Catalyst** (see above). 2) **BBSRC Integrated Biorefining Research and Technology Club (IBTI)** (see above). 3) **BBSRC Bioprocessing Research Industry Club (BRIC)** (http://www.bbsrc.ac.uk/business/collaborative-research/industry-clubs/bric/bric-index.aspx).	1) See above. 2) See above. 3) The **BRIC** aims to support innovative bioprocess-related research, including that needed for the manufacture of complex biopharmaceuticals. To date it has invested £23m in 48 projects. **Funds are not dedicated to type of activity**.	
Communication, stakeholder involvement	1) **Industrial Biotechnology Catalyst** (see above). 2) **Agri-Tech Catalyst** (see above). 3) **TSB Industrial Biotechnology Special Interest Group (IB-SIG)**	1) See above. 2) See above. 3) **IB-SIG** aims to improve the connectivity of the Industrial Biotechnology community that spans government, industry and academia and supports the increasing implementation of industrial biotechnology in the UK and assists in overcoming barriers to adoption. It also provides advice to industry on	

	(https://connect.innovateuk.org/web/industrial-biotechnology). 4) **TSB Industrial Biotechnology Leadership Forum (IBLF)** (https://connect.innovateuk.org/web/industrial-biotechnology). 5) **TSB Algal Biotechnology Special Interest Group (AB-SIG)** (https://connect.innovateuk.org/web/algal-biotechnology-special-interest-group). 6) **TSB Knowledge Transfer Network Ltd (KTN)** (https://connect.innovateuk.org/web/knowledge-transfer-network-limited). 7) **BBSRC Networks in Industrial Biotechnology and Bioenergy (NIBBs)** (http://www.bbsrc.ac.uk/funding/opportunities/2013/networks-in-industrial-biotechnology.aspx). 8) **Waste Resource Action Programme (WRAP)** (http://www.wrap.org.uk/).	available technologies, potential market opportunities, supply chain connections and options for collaborative projects. 4) The **IBLF** operates across its networks to implement the recommendations of the 2009 industrial biotechnology report "Maximising UK opportunities from Industrial Biotechnology in a Low Carbon Economy". 5) **AB-SIG** aims to understand the opportunities and risks to the quality of freshwater and marine environments of using algal biomass as a source of renewable energy and chemicals. 6) **KTN Ltd**, formed in April 2014, brings together all previous separate Knowledge Transfer Networks into one organisation. KTNs aim to deliver improved business performance to technology areas through innovation by helping UK businesses access innovative technologies through partnership and networking. Areas covered include chemistry innovation and the biosciences. 7) **NIBBS** aim to support competitive, cross-disciplinary working between research communities and industry in the industrial biotechnology and bioenergy sectors. 8) **WRAP** is funded by the four UK governments to minimise resource use and divert priority materials from landfill across four strategic areas including food waste reduction and waste as a resource.	
Other areas, please specify			

II Research & Development

Q 5: Specific case-studies of Bioeconomy related research and innovation projects

Please list specific case-studies /examples (success stories) of Bioeconomy research and innovation projects in your country

Global Food Security Programme brings together the food-related research interests across Government, five research councils and the Technology Strategy Board. The programme builds on the partners' existing activities (c. £410m p.a.), adding value to current investments and facilitating joint work around shared goals. It comprises four cross-disciplinary themes: economic resilience; resource efficiency; sustainable food production and supply; and sustainable, healthy, safe diets (http://www.foodsecurity.ac.uk).

Sustainable Agriculture and Food Innovation Platform (SAFIP) supports the Global Food Security Programme, co-funding collaborative research to stimulate innovation through the development of business-led technologies to increase productivity whilst reducing the environmental impact of the agri-food sector. Government investment of £90m between 2010-14 to be matched with that of industry. The Platform is focused on 4 interlinked themes: crop productivity; sustainable livestock production; reduction of food chain waste; and reducing GHG emissions (https://connect.innovateuk.org/web/sustainable-agriculture-and-food-innovation-platform).

Defra is investing £4.5m to support the new **Sustainable Intensification Research and Development Platform**, established in 2013, which will provide funding for research to help farmers increase productivity and profitability whilst reducing environmental impact.

The Scottish Government provides over £50m p.a. to support strategic research on rural affairs and the environment. A **Coordinated Agenda for Marine, Environment and Rural Affairs Sciences** (CAMERAS) ensures alignment between science activities and effective collaboration (http://www.scotland.gov.uk/Topics/Research/About/EBAR).

The **Sustainable Bioenergy Centre** is a virtual centre of 6 academic research groups created in 2009. The centre focuses on the biochemical bioenergy pipeline from growing biomass through to conversion of biomass to bioenergy. The 5 year programme is supported by £20m from the BBSRC with £4m from industry (http://www.bbsrc.ac.uk/organisation/institutes/bsbec/bsbec-index.aspx).

BBSRC is investing £18m in 13 **Networks in Industrial Biotechnology and Bioenergy** (NIBBs) which aim to support competitive, cross-disciplinary working between research communities and industry in the industrial biotechnology and bioenergy sectors. Network coverage includes anaerobic digestion, food processing waste and by-products, chemicals and energy. Funding is also available to support proof of concept studies to demonstrate the benefits to industry (http://www.bbsrc.ac.uk/funding/opportunities/2013/networks-in-industrial-biotechnology.aspx).

A new **Industrial Biotechnology Catalyst**, sponsored by BBSRC, TSB and EPSRC, will support the development and commercialisation of innovative Industrial Biotechnology processes, with £45m to be committed in 2014/15 (http://www.bbsrc.ac.uk/business/collaborative-research/tsb-competitions/ib-catalyst.aspx).

Through the **UK Strategy for Agricultural Technologies** published in 2013, UK Government is investing £160m over the next five years to improve uptake in

research into farming. Two key actions include:

- A £90m government investment in world class **Centres for Agricultural Innovation** with additional investment from industry. These centres will support the widescale adoption of innovation and technology across key sectors, technologies and skills in the food and farming supply chain. This includes £10m for a Centre for Agricultural Informatics and Metrics of Sustainability which will use data from farms, laboratories and retailers to drive innovation.
- Creating a new £70m **Agri-Tech Catalyst**, co-funded with industry, to help new agricultural technologies to bridge the gap between the laboratory and the market place. The catalyst will fund proposals relating to primary crop and livestock production, including aquaculture; non-food uses of arable crops (e.g. biomass); food security and nutrition challenges in international development; and challenges in downstream food processing, provided the solution lies in primary production. (http://www.bbsrc.ac.uk/business/collaborative-research/tsb-competitions/agri-tech-catalyst.aspx)

BBSRC is investing £26m in the **Norwich Research Park** to help create and support new companies and jobs based on world-leading bioscience. The Park comprises four research institutes, all of which engage in agri-tech research: the John Innes Centre and the Sainsbury Laboratory focusing on plant sciences; the Institute of Food Research the sole UK research organisation dedicated to post-farm gate agri-tech; and the Genome Analysis Centre, which plays a pivotal role in sequencing and decoding genomes specifically of relevance to agriculture.

The **Research Councils UK Energy Programme** has a mission to position the UK to meet its energy and environmental targets and policy goals through high quality research and postgraduate training facilitating joint work around shared goals. It brings together five research councils and the Technology Strategy Board and is investing more than £625 million in research and skills to pioneer a low carbon future. Bioenergy is a key part of their activities (http://www.rcuk.ac.uk/research/xrcprogrammes/energy/).

The **EPSRC SUPERGEN Bioenergy Hub** aims to bring together industry, academia and other stakeholders to focus on the research and knowledge challenges associated with increasing the contribution of UK bioenergy to meet strategic environmental targets in a coherent, sustainable and cost-effective manner (http://www.supergen-bioenergy.net/).

II Research & Development Q 6: Potential benefit of European research cooperation			
	Is there a benefit of European cooperation? Please insert priority ranging from 5 (= high) to 1 (= low)	**Are there any transnational cooperations established between your country and other EU Member States?** If yes please specify.	**Comment/specification**
Common sustainability criteria/ GHG emissions		• *Climate Impact Research and Response Coordination for a Larger Europe ERA-NET* (CIRCLE-2) (www.circle-era.eu). • *Bioenergy Sustaining the Future ERA-NET Plus* (BESTF2) (http://eranetbestf.net/two). • *Facing Sustainability: new relationships between rural areas and agriculture in Europe ERA-NET* (RURAGRI) (www.ruragri-era.net). • *Cooperation and shared strategies for Biodiversity research programmes in Europe ERA-NET* (BIODIVERSA2) (www.biodiversa.org). • *Agriculture, Food Security and Climate Change Joint Programming Initiative* (FACCE-JPI) (www.faccejpi.com). • *Connecting climate knowledge for Europe Joint Programming Initiative* (www.jpi-climate.eu). • *Infrastructure for Analysis and Experimentation on Ecosystems* (AnaEE) (http://www.anaee.com/). • *Global Research Alliance on Agricultural Greenhouse Gases* (GRA) (http://www.globalresearchalliance.org/)	• The GRA is a global programme but includes partners from UK and other EU Member States.
Resource efficiency		• *Innovation in the forest-based sector for increasing resource efficiency and tackling climate change with competitive customer solutions ERA-NET Plus* (WOODWISDOM-NET+) (www.woodwisdom.net). • *Industrial Biotechnology ERA-NET* (ERA-IB2) (www.era-ib.net). • *Bioenergy ERA-NET* (www.eranetbioenergy.net). • *Agriculture, Food Security and Climate Change Joint Programming Initiative* (FACCE-JPI) (www.faccejpi.com). • *Water challenges for a changing world Joint Programming*	

		Initiative (www.waterjpi.eu/water-jpi).	
Renewable resources/ bio-based products		• *Industrial Biotechnology ERA-NET* (ERA-IB2) (www.era-ib.net). • *Bioenergy ERA-NET* (www.eranetbioenergy.net). • *Bioenergy Sustaining the Future ERA-NET Plus* (BESTF2) (http://eranetbestf.net/two). • *ERA-NET for Coordinating Action in Plant Sciences* (ERA-CAPS) (www.eracaps.org). • *Sustainable Forest Management and Multifunctional Forestry ERA-NET* (SUMFOREST) (www.sumforest.org).	
Knowledge transfer and good practice and innovation		• *Industrial Biotechnology ERA-NET* (ERA-IB2) (www.era-ib.net). • *Bioenergy ERA-NET* (www.eranetbioenergy.net). • *Bioenergy Sustaining the Future ERA-NET Plus* (BESTF2) (http://eranetbestf.net/two). • *ICT and Robotics for Sustainable Agriculture ERA-NET* (ICT-AGRI2) (www.ict-agri.eu). • *Eco-innovation ERA-NET* (ECO-INNOVERA) (www.eco-innovera.eu). • *Agriculture, Food Security and Climate Change Joint Programming Initiative* (FACCE-JPI) (www.faccejpi.com).	
Economic/ market framework		• *Bioenergy Sustaining the Future ERA-NET Plus* (BESTF2) (http://eranetbestf.net/two).	
Policy framework		• *Agriculture, Food Security and Climate Change Joint Programming Initiative* (FACCE-JPI) (www.faccejpi.com).	
Healthy food research		• *A Healthy Diet for a Healthy Life Joint Programming Initiative* (HDHL) (www.healthydietforhealthylife.eu). • *FOODBEST* consortium (http://www.oresund.org/foodkic/about-foodbest).	
Bioenergy		• *Bioenergy ERA-NET* (www.eranetbioenergy.net). • *Bioenergy Sustaining the Future ERA-NET Plus*	

		(BESTF2) (http://eranetbestf.net/two).	
Animal feed		• *Agriculture, Food Security and Climate Change Joint Programming Initiative* (FACCE-JPI) (www.faccejpi.com).	
Development of an agreed methodology for environmental footprints		• *Infrastructure for Analysis and Experimentation on Ecosystems* (AnaEE) (http://www.anaee.com/).	
Biorefineries		• *Industrial Biotechnology ERA-NET* (ERA-IB2) (www.era-ib.net). • *Bioenergy ERA-NET* (www.eranetbioenergy.net).	
Food security		• *Integrated Pest Management ERA-NET* (C-IPM) (www.c-ipm.org). • *ICT and Robotics for Sustainable Agriculture ERA-NET* (ICT-AGRI2) (www.ict-agri.eu). • *Sustainable Food Production and Consumption ERA-NET* (SUSFOOD) (www.susfood-era.net). • *Strengthening cooperation in European research on sustainable exploitation of marine resources in the seafood chains ERA-NET* (COFASP) (www.cofasp.eu). • *Coordination of European transnational research in organic food and farming systems ERA-NET* (CORE ORGANIC2) (www.coreorganic2.org). • *European phytosanitary research coordination ERA-NET* (EUPHRESCO2) (www.euphresco.org). • *Agriculture, Food Security and Climate Change Joint Programming Initiative* (FACCE) (www.faccejpi.com). • *Wheat Initiative* (http://www.wheatinitiative.org/).	• The Wheat Initiative is a global programme but includes partners from UK and other EU Member States.
Social inclusion			
Algae		• *Industrial Biotechnology ERA-NET* (ERA-IB2) (www.era-ib.net). • *Bioenergy ERA-NET* (www.eranetbioenergy.net).	
Genetics			
Other areas, please specify:			

Plant Sciences		• *ERA-NET for Coordinating Action in Plant Sciences* (ERA-CAPS) (www.eracaps.org).	
Animal Sciences		• *Coordination of European Research on Emerging and Major Infectious Diseases of Livestock ERA-NET* (EMIDA) (www.emida-era.net). • *Animal Health and Welfare ERA-NET* (ANIHWA) (www.anihwa.eu). • *Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses* (STAR-IDAZ) (www.star-idaz.net). • *Global Foot and Mouth Disease Research Alliance* (http://www.ars.usda.gov/GFRA/index.htm).	• STAR-IDAZ is a global network but includes partners from UK and other EU Member States. • Global FMD Research Alliance includes from UK and other EU Member States.
Marine		• *Towards integrated European marine research strategy and programmes ERA-NET* (SEASERA) (www.seas-era.eu). • *Healthy and Productive Seas and Oceans Joint Programming Initiative (*www.jpi-oceans.eu)	
		• *Development and coordination of synthetic biology in the ERA* (ERA-NET) (ERASYNBIO) (www.erasynbio.eu). • *Systems biology research stimulating the widespread adoption of systems approaches in biomedicine, biotechnology, and agri-food ERA-NET Plus* (ERA-SYSBIO+) (www.erasysbio.net).	

[ii] List of the Research programmes (Agriculture activities):

- Agro-food and natural resources economics
  http://www.sicris.si/search/prg.aspx?lang=eng&id=9224&opt=1

- Endocrine,immune,nervous and enzyme responses in healty and sick animals
  http://www.sicris.si/search/prg.aspx?lang=eng&id=9225&opt=1

- Agrobiodiversity
  http://www.sicris.si/search/prg.aspx?lang=eng&id=8595&opt=1

- Genetics and modern technologies of agricultural plants
  http://www.sicris.si/search/prg.aspx?lang=eng&id=6252&opt=1

- Applied Botany, Genetics and Ecology
  http://www.sicris.si/search/prg.aspx?lang=eng&id=6253&opt=1

- Animal health, environment and food safety
  http://www.sicris.si/search/prg.aspx?lang=eng&id=6254&opt=1
- Nutrition and microbial ecology of gastrointestinal tract
  http://www.sicris.si/search/prg.aspx?lang=eng&id=9226&opt=1

- Microbiology and biotechnology of food and environment
  http://www.sicris.si/search/prg.aspx?lang=eng&id=6257&opt=1

- Sustainable Agriculture
  http://www.sicris.si/search/prg.aspx?lang=eng&id=8596&opt=1

- Biotechnology and Systems Biology of plants
  http://www.sicris.si/search/prg.aspx?lang=eng&id=6261&opt=1

- Molecular biotechnology: from dynamics of biological systems to applications
  http://www.sicris.si/search/prg.aspx?lang=eng&id=6262&opt=1

- Comparative genomics and genomic biodiversity
  http://www.sicris.si/search/prg.aspx?lang=eng&id=6263&opt=1

- Integrated food technology and nutrition
  http://www.sicris.si/search/prg.aspx?lang=eng&id=8597&opt=1

- Isolation of large biomolecules and nanoparticles
  http://www.sicris.si/search/prg.aspx?lang=eng&id=8598&opt=1

[ii] List of the Research programmes (Forestry activities):

- Forest, forestry and renawable forest resources
  http://www.sicris.si/search/prg.aspx?lang=eng&id=6250&opt=1

- Forest biology, ecology & technology
  http://www.sicris.si/search/prg.aspx?lang=eng&id=6256&opt=1

[iii] List of the Research programmes (Industrial uses of biomass - Wood and products….):

- Wood and lignocellulosic composites
  http://www.sicris.si/search/prg.aspx?lang=eng&id=6247&opt=1

- Biochemical and biophysical characterization of natural compounds
  http://www.sicris.si/search/prg.aspx?lang=eng&id=9227&opt=1

- Pharmaceutical Biotechnology: Knowledge for Health
  http://www.sicris.si/search/prg.aspx?lang=eng&id=6259&opt=1