



Bioeconomy strategy development in EU regions

The European Commission's Knowledge Centre for Bioeconomy



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Joint Research Centre

Contact information

KNOWLEDGE CENTRE FOR BIOECONOMY

EC-Bioeconomy-KC@ec.europa.eu

DG Research & Innovation

Contact Information

RTD BIOECONOMY COMMUNICATION

RTD-BIOECONOMY@ec.europa.eu

EU Science Hub

https://joint-research-centre.ec.europa.eu/index_en

<https://knowledge4policy.ec.europa.eu/bioeconomy>

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Authors

Silke Haarich, Spatial Foresight
Stephanie Kirchmayr-Novak, ÖIR

Editors

Javier Sanchez Lopez, JRC
Maria Teresa Borzacchiello, JRC
Marios Avraamides, JRC

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Abstract

This publication is the final report of a study aiming to map and analyse the deployment of strategies related to the bioeconomy at regional level in the EU-27. The study was conducted from July 2021 to March 2022 and covered regulatory frameworks in place or under development as of November 2021.

The focus of the study was on regions at NUTS 1 and NUTS 2 territorial levels. The NUTS 3 level was only analysed in cases where no relevant information could be found at higher levels. Usually, the research focused on the predominant sub-national NUTS level in each country, on what is usually classified as the 'regional level' in between national and local levels.

The findings show that 194 regions in the EU-27 (NUTS 1, NUTS 2 or NUTS 3 level) have, or are working towards, a strategic framework related to the bioeconomy. Of these, 28 regions have fully dedicated bioeconomy strategies, while another region is elaborating such a strategy. 62 regions have strategic frameworks with a strong bioeconomy focus, with another 7 regions elaborating such a strategy. Lastly, 94 regions have strategies with minimum bioeconomy content, while another 2 regions are elaborating a strategy of this type.

In relative terms, i.e. in relation to the overall number of regions per country, all regions in Belgium, France, Italy and the Netherlands have developed bioeconomy-relevant frameworks.

Overall, there are 359 bioeconomy-related strategies at regional level in the EU-27. Of those, 334 frameworks have been published. Of these 334, 324 are regional and 10 are multi-regional (e.g. cross-border, interregional or macroregional, mostly Interreg-funded) strategic frameworks.

The report includes a methodological note, a presentation of the data and visualisations resulting from the mapping, an analysis of commonalities and divergences between regional strategies across the EU based on their general characteristics and a focused summary for each Member State. It is complemented by the underpinning dataset, published separately.

Executive summary

This report presents the results of a study conducted from July 2021 to March 2022 with the aim of mapping and analysing the deployment of regional strategies related to the bioeconomy in the European Union (EU-27). The study covered regulatory frameworks in place or under development as of November 2021 (mapping cut-off date).

Policy context

The bioeconomy covers all sectors and systems that rely on biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions and principles. It includes and interlinks: land and marine ecosystems and the services they provide; all primary production sectors that use and produce biological resources (agriculture, forestry, fisheries and aquaculture); and all economic and industrial sectors that use biological resources and processes to produce food, feed, bio-based products, energy and services.

In 2012¹, the Commission presented an EU Bioeconomy Strategy. The Communication was accompanied by a detailed Action Plan to deliver on the Bioeconomy Strategy and its objectives. In 2018, the European Commission updated its Bioeconomy Strategy and presented a new Action Plan².

At the same time, the European Commission launched an initial mapping of strategies in Europe at regional level³. The study showed that bioeconomy related research and innovation (R&I) was a priority for most European countries and regions during the time period 2014-2020. Out of 210 territorial units analysed (EU regions and countries), 207 (98.6%) included bioeconomy related aspects in their 2014-2020 R&I priorities and plans. The identification of strategies was challenging since denominations of bioeconomy aspects in the regions varied from low-carbon, green growth, sustainable agriculture, innovative food production, green chemistry, eco-innovation and circular economy to blue growth. However, that study provided an initial overall examination of bioeconomy strategies at regional level. Since then, the deployment of bioeconomy strategies at the national and regional level has accelerated; that information is hence partially outdated.

To further track the deployment of the bioeconomy across the EU, the Joint Research Centre (JRC) has been mapping the Member States' progress in developing national strategies and other policy initiatives dedicated to the bioeconomy, as input to the European Commission's Knowledge Centre for Bioeconomy⁴. At regional level, however, the large number of relevant topics, initiatives, platforms and stakeholders covering different territorial levels, languages, etc. hindered having a comprehensive and updated overview of bioeconomy-relevant strategies. This study aims to close this gap.

Methodological note

For the purpose of this study, "Bioeconomy strategy" means a regulatory framework set by official/governmental authorities that describes how policy objectives and goals can be achieved. This definition includes different types of policy interventions/initiatives, labelled Strategies, Action Plans, Roadmaps and/or Resource Management Plans that promote the development of bio-based value chains as part of a sustainable and circular bioeconomy.

The analysis mainly focused on regions NUTS 1 and NUTS 2 territorial levels. The NUTS 3 level was only analysed in cases where no relevant information could be found on a larger scale. Usually, the research focused on the pre-dominant sub-national NUTS level in each country, on what is usually classified as the 'regional level' in between national and local levels in each specific country. This is also the level on which territorial or regional

¹ European Commission 2012

² European Commission 2018a

³ European Commission 2018b

⁴ https://knowledge4policy.ec.europa.eu/bioeconomy_en

strategies are defined in most of the cases, for example in the context of the EU Cohesion Policy Regional Development Plans and Operational Programmes. In some countries, this is NUTS 1 level (e.g. Germany), in other NUTS 2 (e.g. Spain, Poland), while in other countries regional strategies are often decided at NUTS 3 level (e.g. Sweden, Hungary). However, in several cases the desk research also identified relevant strategic frameworks for others than the pre-dominant NUTS levels or, in rare cases, for multiple territorial areas not covered by one unique NUTS code.

In order to map regional bioeconomy strategies the following methods were applied: a) desk research (as the primary method to collect information) and b) a web-based survey for relevant stakeholders at national and/or regional level.

The desk research was based on official documents and other sources for all EU Member States in different languages, in order to identify and gather data related to current or planned regional bioeconomy strategies. Keywords in several national languages were identified and used to search for relevant strategic frameworks. National experts were assigned to one or more EU countries. They were in charge of collecting data from the assigned Member States and regions for which a guidance document was provided.

As a second step, a web-based survey was launched targeting relevant stakeholders at regional and national level in all EU Member States: a) bioeconomy experts (e.g. managers of bioeconomy clusters, bioeconomy business associations, bioeconomy researchers, bioeconomy experts in business) and b) national and/or regional public authorities, in particular relevant departments in regional governments, as well as regional innovation agencies or regional development agencies. In total, 58 responses from almost all EU Member States was gathered with relevant information either hinting at documents that had not been previously identified or with confirmation of the existence or absence of strategic frameworks at regional level. This information was then validated by the national experts and integrated into the existing data for further analysis.

Based on this information, a database was elaborated in MS EXCEL. The relevant data per country or on specific research questions was then analysed coherently. The dataset with the detailed information on the strategies identified, is publicly available⁵ and complements this report.

The research focused on valid strategic frameworks to deploy the bioeconomy in a given region. The research predominantly identified strategies published during the years 2018-2021 or planned to be published in 2022 (and available in a draft version). Older strategies (i.e. from 2014-2017) have been considered and included in the database, only if the research has shown that they are still in use or have a prominent status on regional websites/in discussions.

Research was first and foremost, on the identification of the relevant regional strategies in Europe. Whilst a deep qualitative assessment of the content of such strategies, was outside the scope of this study, we carried out a qualitative categorisation of the strategies into 'fully dedicated bioeconomy strategies', 'strategies with a strong bioeconomy focus' and strategies with 'a minimum bioeconomy content'⁶ and a basic analysis of some general characteristics of those strategies across the EU. This can provide an initial overview of how bioeconomy is addressed within the strategic frameworks and further analyses would be necessary to compare the content and quality of bioeconomy strategies in Europe.

⁵ <https://publications.jrc.ec.europa.eu/repository/handle/JRC128960>

⁶ For a more detailed description of the methodology followed for this categorisation, see the methodological note in Section 2.3 of this report.

Mapping results

Many European regions have multiple strategies in place, or under development, that relate to the bioeconomy in one way or another or tackle it from different angles. This means that the number of bioeconomy strategies at regional level is considerably higher than the number of regions with bioeconomy strategies.

The results from the mapping (Chapter 3) show that 194 regions⁷ in the EU-27 have, or are working towards, a strategic framework related to the bioeconomy. Of these, 28 regions have fully dedicated bioeconomy strategies while another region is elaborating such a strategy; 62 regions have strategic frameworks with a strong bioeconomy focus, with another 7 regions elaborating such a strategy; and lastly, 94 have strategies with minimum bioeconomy content, while another 2 regions are elaborating a strategy of this type.

In absolute terms, Italy is the country with the largest number of regions with strategies, adopted or under development, related to the bioeconomy (21), followed by Sweden (20), France (18), Spain (17), Finland (16) and Poland (16).

The analysis of all EU Member States shows that 6 European countries, namely, Finland, France, Italy, Poland, Spain and Sweden display intense⁸ regional strategic action to deploy the bioeconomy. Due to the fact that these are larger countries, there are more than 30 bioeconomy-relevant strategies published or under development. Fifteen countries have between 1 and 17 regional bioeconomy strategies per country. These countries are: Austria, Belgium, Croatia, Czechia, Denmark, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, the Netherlands, Portugal, Romania and Slovakia. Finally, there are 6 EU Member States with no bioeconomy-relevant regional strategies; they are mostly smaller countries without regional administrative levels – except Bulgaria. These countries are Bulgaria, Cyprus, Estonia, Luxemburg, Malta and Slovenia.

In relative terms, i.e. in relation to the overall number of regions per country, all regions in Belgium, France, Italy and the Netherlands have developed bioeconomy-relevant frameworks. Furthermore, France, Italy, Finland, Belgium and Sweden have the highest shares of regional strategies with a full and strong focus.

Overall, 359 bioeconomy-related strategies (published and under development), were identified at regional level in the EU-27. Of those, 334 frameworks are published in the form of strategies, action plans, roadmaps etc. and the rest are under development.

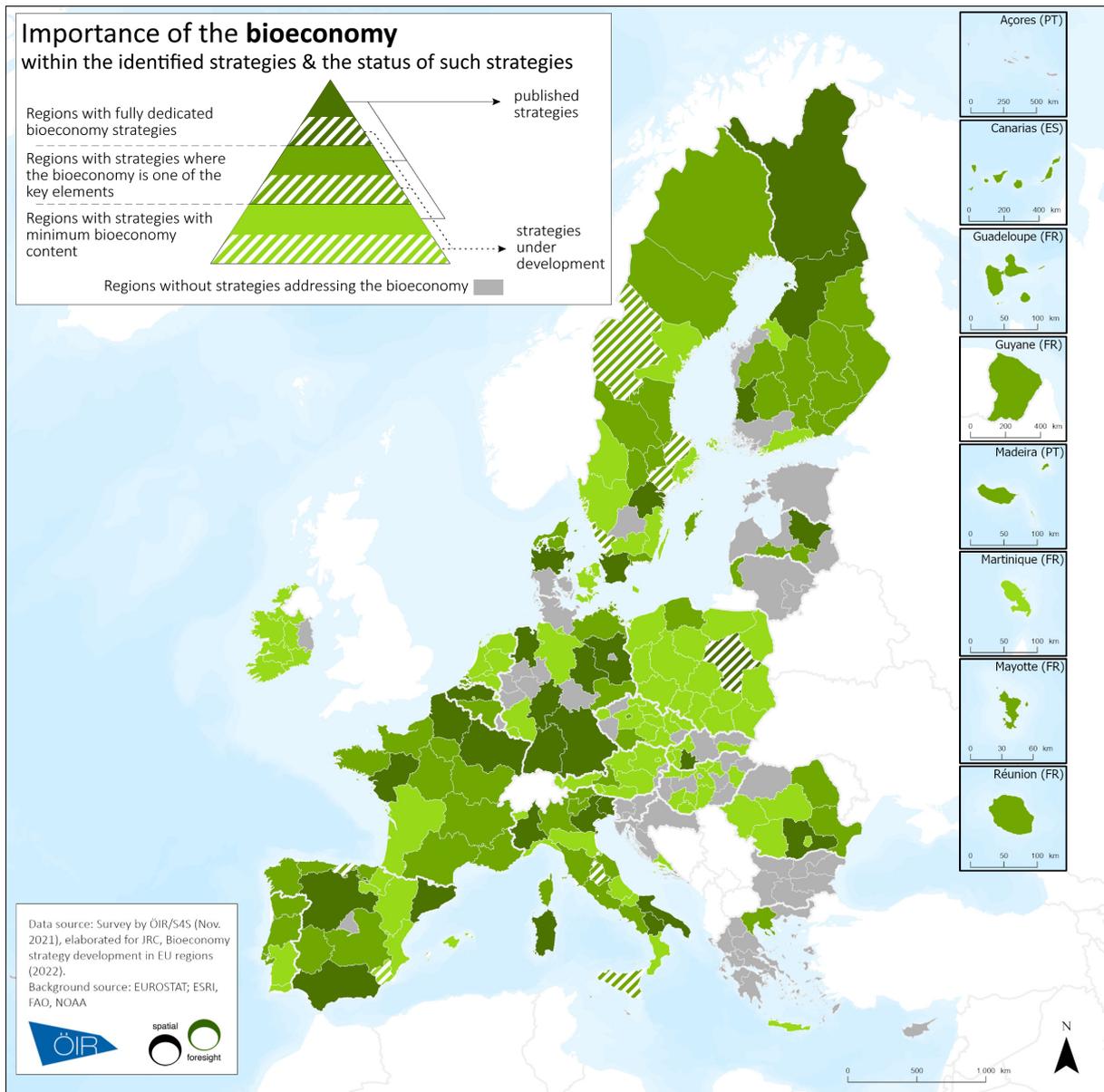
83 regional strategies related the bioeconomy are sectoral strategies (e.g. forestry or waste strategy) and another 209 treat the bioeconomy as an embedded topic within a wider strategic framework (e.g. circular economy).

During the data collection for regional strategies, some strategies/action plans at local level were also identified. As this type of strategy was not the focus of the study, data for such strategies should be considered partial: more bioeconomy strategies at local level, even at urban or metropolitan level may exist.

⁷ NUTS 1, NUTS 2 or NUTS 3. For a more detailed definition of 'region', see the methodological note in this summary or Section 2.4 of the report.

⁸ Intense means in this case a relatively high absolute number of bioeconomy-related strategies published or under development per country and many different regions with bioeconomy-related strategies

EU regions with bioeconomy strategies



Note: Some regions have multiple strategies related to bioeconomy. On this map, regions appear only with the strategy that is ranked highest in the strategy pyramid (see map legend). Regions covered by multiple regional strategies at different NUTS levels appear only with the strategy that is ranked highest in the strategy pyramid (e.g. a NUTS 3 region, with a strategy of minimum bioeconomy content, that is part of a NUTS 2 region with a strategy where the bioeconomy is one of the key elements, appears under the NUTS 2 region. On the other hand, a NUTS 3 region, with a strategy where the bioeconomy is one of the key elements and which is part of a NUTS 2 region with a strategy of minimum bioeconomy content, is shown separately).

Disclaimer: National or cross-country/cross-regional strategies are not represented on the map.

Analysis

The study analysed some general characteristics of regional strategies across the EU (Chapter 4). This analysis provides insights into commonalities and divergences between regional strategies in terms of their main objectives, the documents' year of publication, the sectors covered, the biomass resources addressed, as well as the policy measures included in the documents.

The regional strategic frameworks link directly to the five objectives of the EU Bioeconomy Strategy. The objective most frequently addressed, is the 'Sustainable management of natural resources'. 'Reducing the dependence on non-renewable resources' and

'Strengthening the competitiveness of the regions and creating jobs' are also prominent objectives addressed by the regional strategies.

Most of the strategies analysed have been published in recent years. In particular, the high number of strategies published in 2021 is remarkable. This may be due to the fact that a new Multiannual Financial Framework starts in 2021 and many regional strategies are aligned with the time frame for the new EU programmes (2021-2027).

The sectors addressed by the regional bioeconomy strategies can be grouped into sectors that supply biomass (supply) and sectors that convert biomass into intermediate or end products (demand). According to our analysis, one third of the sectors addressed concerns the supply side, mostly agriculture and forestry, but also organic waste. Fisheries and aquaculture are included in fewer strategies, presumably due to the geography of the regions. Another third of the sectors addressed relate to biomass processing and conversion, often linked to bioenergy and biofuels, agri-food or construction. Only few bioeconomy strategies aim at enhancing the value added of the bioeconomy sector, while some strategies, mostly the fully dedicated strategies, address all steps of the bioeconomy value chain.

The regional bioeconomy strategies focus on a wide range of biomass resources. Forestry-based biomass is most often part of the strategies as well as agricultural biomass and agricultural residues. Furthermore, different forms of waste (food, organic household and industrial waste) are frequently mentioned in the strategic documents. Aquatic biomass is also mentioned.

The study also includes brief summaries for each of the 27 EU Member States, presenting the situation for regional strategies related to bioeconomy in each country (Chapter 5).

Patterns

Certain patterns could be observed per country, e.g. how and in which wider frameworks the bioeconomy is embedded. For example, in Spain the bioeconomy is often included in circular economy strategies, while in Italy, it is typically addressed within sustainable development strategies. In Finland, the bioeconomy is covered in almost every Regional Development Plan and in many Smart Specialisation strategies, but also often in climate plans.

The administrative level on which bioeconomy strategies exist largely depends on the administrative organisation of the different countries and which regional (NUTS) level has the legal competence to develop regional strategies. For example, most strategies in Germany and France exist at NUTS 1 level; most strategies in Romania, Poland, Spain and Italy are at NUTS 2 level; whereas strategies in Finland, Sweden or Hungary mostly exist at NUTS 3 level.

Belgium is a specific case and the only country where the bioeconomy is not treated as a national competence, but directly as a regional competence field. This is the reason why there is no national strategy but strategies in each one of the regions.

The existence of regional bioeconomy strategies mainly depends on two factors. First, if the country is large and decentralised, it is likely that strategies related to the bioeconomy exist at regional level. One exception is Bulgaria, where regional strategies could not be found, despite being a relatively large country. No regional strategies were identified for the smallest EU countries (Luxembourg, Malta, Cyprus). Second, where a strategy for bioeconomy exists at national level, it can also apply to regional and local action and so, consequently, there may be fewer (dedicated) strategies at regional level. This is the case in Finland or Germany where there are important documents at national level. In this case, bioeconomy at sub-national level may then be predominantly embedded in wider strategic frameworks. However, even if a national strategy exists, there may still be regional frameworks to further specify actions and to focus on the specificities of the regions (e.g. in the case of France and Portugal).

It must be noted that the European Territorial Cooperation Programmes – Interreg- play an important role in the development of regional and, especially, multi-regional bioeconomy strategies. Interreg projects are often mentioned as the origin of regional strategic frameworks, or action plans in countries without a systematic deployment of the bioeconomy at regional level. They are the motor behind all multi-regional bioeconomy strategies identified during the study. The BIOEAST initiative⁹ has a similar role, with considerable involvement at national level. BIOEAST promotes bioeconomy development in 11 central and eastern European countries, where bioeconomy deployment is currently less advanced. BIOEAST is supported by the European Union's Horizon 2020 Programme for Research and Innovation.

⁹ <https://bioeast.eu/>

1 Introduction

This report is the result of a study conducted from July 2021 to March 2022 with the aim of mapping and analysing the deployment status of regional strategies related to the bioeconomy in the European Union (EU-27). The study covered regulatory frameworks at NUTS 1, NUTS2 or NUTS 3 scale and analysed commonalities and divergences between such strategies across the EU, based on their general characteristics. This report presents the situation as of November 2021.

1.1 Policy context

The bioeconomy covers all sectors and systems that rely on biological resources (animals, plants, micro-organisms and derived biomass, including organic waste), their functions and principles. It includes and interlinks: land and marine ecosystems and the services they provide; all primary production sectors that use and produce biological resources (agriculture, forestry, fisheries and aquaculture); and all economic and industrial sectors that use biological resources and processes to produce food, feed, bio-based products, energy and services.

In 2012¹⁰, the Commission presented an EU Bioeconomy Strategy. The Communication was accompanied by a detailed Action Plan to deliver on the Bioeconomy Strategy and its objectives. In 2018, the European Commission updated its Bioeconomy Strategy and presented a new Action Plan¹¹.

At the same time, the European Commission launched an initial mapping of strategies in Europe at regional level¹². The study showed that bioeconomy related research and innovation (R&I) was a priority for most European countries and regions during the time period 2014-2020. Out of 210 territorial units analysed (EU regions and countries), 207 (98.6%) included bioeconomy-related aspects in their 2014-2020 R&I priorities and plans. The identification of strategies was challenging since denominations of bioeconomy aspects in the regions varied from low-carbon, green growth, sustainable agriculture, innovative food production, green chemistry, eco-innovation and circular economy to blue growth. However, that study provided an initial overall examination of bioeconomy strategies at regional level. Since then, the deployment of bioeconomy strategies at national and regional level has accelerated, that information hence being partially outdated.

To further track the deployment of the bioeconomy across the EU, the Joint Research Centre (JRC) has been mapping the progress of Member States developing national strategies and other policy initiatives dedicated to the bioeconomy as input to the European Commission's Knowledge Centre for Bioeconomy¹³.

The JRC work provided an initial comprehensive overview of key country-specific information was created, such as the main institutions involved in the bioeconomy policy, the definition of the bioeconomy and available strategies at national, macro-regional and regional level. At regional level, however, the large number of relevant topics, initiatives, platforms and stakeholders covering different territorial realities, languages, etc. hindered having a comprehensive and updated overview of bioeconomy-relevant strategies. This study aims to close this gap.

¹⁰ European Commission 2012

¹¹ European Commission 2018a

¹² European Commission 2018b

¹³ https://knowledge4policy.ec.europa.eu/bioeconomy_en

1.2 Report structure

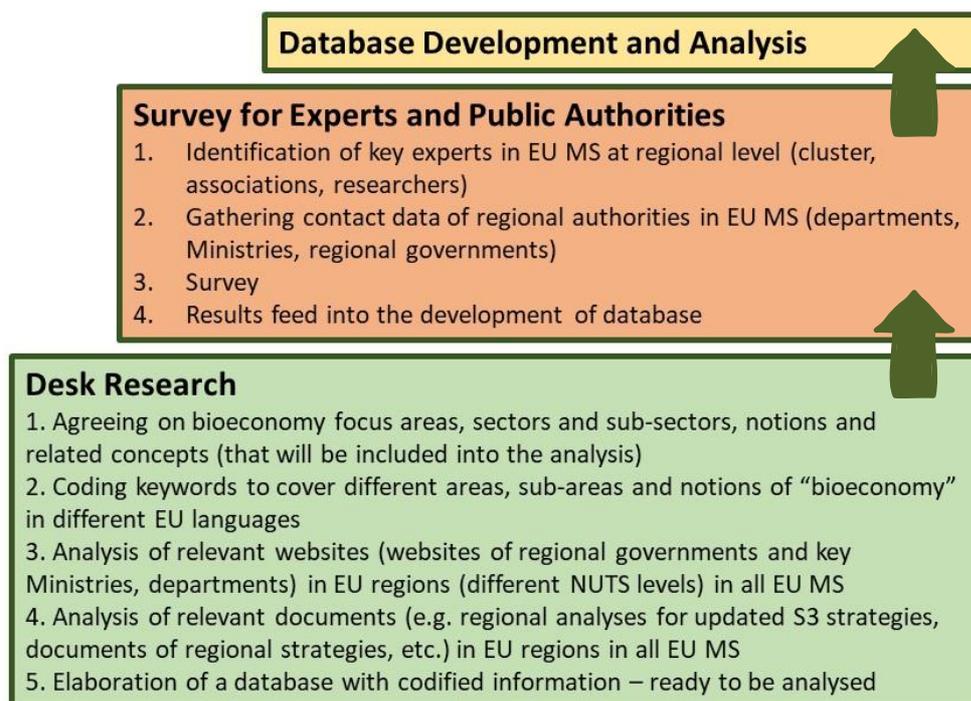
The report is organised as follows. Chapter 2 presents a methodological note that explains the approach used, relevant conceptual clarifications and limitations of the research in more detail. Chapter 3 provides an overview of the overall mapping results in the EU-27. Chapter 4 presents a brief analysis of commonalities and divergences between regional strategies based on their general characteristics. Chapter 5 provides summaries of the bioeconomy-relevant strategies at regional level for each EU Member State.

2 Methodological note

For the purpose of this study, “Bioeconomy strategy” means a regulatory framework set by official/governmental authorities that describes how policy objectives and goals can be achieved. This definition includes different types of policy interventions/initiatives, labelled Strategies, Action Plans, Roadmaps and/or Resource Management Plans that promote the development of bio-based value chains as part of a sustainable and circular bioeconomy.

In order to map regional bioeconomy strategies (at NUTS 1, NUTS 2 or, exceptionally, at NUTS 3 level), the methodology followed is presented in Figure 1 and described hereafter.

Figure 1 Methodological framework



2.1 Desk research

Desk research was based on official documents and other sources in all EU Member States in different languages, in order to identify and gather data related to current or planned regional bioeconomy strategies. Keywords were identified in several national languages and used to search for relevant strategic frameworks. National experts (mostly researchers from Spatial Foresight and the ÖIR) were assigned to one or more EU countries. They were in charge of collecting data from the assigned Member States and regions for which a guidance document was provided.

2.2 Web-based survey

As a second step, a web-based survey was launched for the following relevant stakeholders at regional and national level of all EU Member States:

- bioeconomy experts (e.g. bioeconomy cluster managers, bioeconomy business associations, bioeconomy expert researchers, bioeconomy experts in business)
- national and/or regional public authorities, in particular relevant departments in regional governments, as well as regional innovation agencies or regional development agencies.

The survey was available in English. The survey ran from 2-25 November 2021. The result included 58 responses gathered from almost all EU Member States with relevant

information either hinting at documents that had not been previously identified or with confirmation of strategic frameworks or the lack of strategies at regional level. Most responses revealed information on the status of strategic documents, linkages with bioeconomy in sectoral documents or the plans for funding bioeconomy actions in the future.

This information was then validated by the national experts and integrated into the database for further analysis.

2.3 Conceptual clarification

The research team classifies the strategies as follows:

- 'full/dedicated' bioeconomy strategies: those strategies that are exclusively focused on bioeconomy deployment, be it in one sector, many sectors, one part of the value chain or different parts of the value chain. Usually, these strategies or plans have bioeconomy in the title and a large share of the content is on the deployment of the bioeconomy
- 'strategies with a strong bioeconomy focus': those that also focus on other topics, themes or sectors, but where bioeconomy is at least a key element, e.g. at least one chapter, one priority axis, one objective of a wider strategic framework focuses on the bioeconomy and describes its deployment in detail
- 'embedded' strategy: when the main theme and a large share of the content is on a wider topic or pursues a wider objective - e.g. economic development, sustainable development, blue growth- but where bioeconomy is also mentioned or is part of the content/objectives/actions
- 'sectoral' strategy: when the title of the document and a large share of its content are specifically dedicated to the development of a sector, e.g. agriculture, agri-food, forestry, waste plans, energy plans, including or mentioning bioeconomy-related topics/actions/objectives. We have not included sectoral strategies per se when they do not show any content or linkage to bioeconomy-related concepts, actions or objectives.

2.4 Understanding of 'region'

The focus of the study was on the NUTS 1 and NUTS 2 territorial levels. The NUTS 3 level was only analysed in cases where no relevant information could be found at higher levels. Usually, the research focused on the pre-dominant sub-national NUTS level in each country, on what is usually classified as 'regional level' in between national and local levels. This is also the level where territorial or regional strategies are defined in most of the cases, for example in the context of the EU Cohesion Policy Regional Development Plans and Operational Programmes. In some countries, this is NUTS 1 level (e.g. Germany), in other NUTS 2 (e.g. Spain), while in other countries territorial and regional strategies are often decided at NUTS 3 level (e.g. Sweden). However, in several cases the desk research also identified relevant strategic frameworks for other levels than the pre-dominant NUTS levels or even multiple territorial areas not covered by one unique NUTS code.

2.5 Timeframe

The research focused on valid strategies to deploy the bioeconomy in a given region, i.e. mostly strategies published during the years 2018-2021 or to be published in 2022 (and available in a draft version).

Older documents and strategies (i.e. from 2014-2017) have been considered and included in the database only when research has shown that they are still in use or have a prominent status on regional websites/in discussions.

The research has also identified many documents that are undergoing a development process and have not yet been published. They have been included in the database when either a draft version was available for analysis, and/or when sufficient information on the

strategic frameworks under development was available through secondary sources (news items or press notes on regional or national websites, description of the development process, call for tenders, responses to the mapping survey).

Smart Specialisation Strategies (S3) were considered as one of the main strategic frameworks to include bioeconomy content. They were primarily considered when they referred to the period 2021-2027. However, documents with other timeframes were also identified (e.g. 2018-2020) and included in the database when appropriate. Older S3 documents, which were defined for the 2014-2020 period, have generally not been considered unless they were still prominent in regional information sources and clearly in use.

2.6 Limitations

Some limitations to the research have to be mentioned, as follows:

- The identification of strategies was challenging since denominations of bioeconomy aspects in the regions varied from low-carbon, green growth, sustainable agriculture, innovative food production, green chemistry, eco-innovation and circular economy to blue growth. This required, as an initial step, developing a 'working definition' for this study on the relevant sectors, notions and concepts of 'bioeconomy'. The challenge was to find a common understanding that reflects reality in all 27 EU Member States.
- It was a challenge to find consistent and detailed documentation on all regions. The researchers had to understand the 'logic' of a given country and its regions relating to the use of the bioeconomy concept in strategies and action plans, by checking the availability of documents on websites of institutions and organisations at different administrative levels. Usually, different public authority websites (e.g. on environment, economy, innovation, waste, forestry, etc.) needed to be checked for relevant content. Sometimes it was necessary to get into contact (e.g. via email, phone calls) with relevant authorities to obtain further clarification. The survey was a valuable tool to validate existing and identify new information.
- Data collection naturally required an understanding of the national languages. However, terms related to 'bioeconomy' may be slightly different in the different languages and there are also different traditions of understanding the 'bioeconomy'. This challenge complicated the search for relevant documents and required country-specific approaches.
- The study focused on 'new' strategies published after 2018, but it was not possible to set a fixed timeframe. Occasionally, older documents were also integrated into the database when there was sufficient indication that they are still valid and regions still use them.
- Research was, first and foremost, on the identification of the relevant regional strategies in Europe. Whilst a deep qualitative assessment of the content of such strategies, was outside the scope of this study, we carried out a qualitative categorisation of the strategies into 'fully dedicated bioeconomy strategies', 'strategies with a strong bioeconomy focus' and strategies with 'minimum bioeconomy content' and a basic analysis of some general characteristics of those strategies across the EU. This can provide an initial overview of how bioeconomy is tackled within the strategic frameworks and further analyses would be necessary to compare the content and quality of bioeconomy strategies in Europe. It is likely that some strategic frameworks have a more innovative understanding of bioeconomy than others. Some mention bioeconomy in the context of biomass production only, while others foresee the creation of new bio-based industries and products at a very advanced level.

3 Mapping results

Many European regions have multiple strategies in place, or under development, that relate to the bioeconomy in one way or another or tackle it from different angles. This means that the number of bioeconomy strategies at regional level is considerably higher than the number of regions with bioeconomy strategies. This chapter provides an overview on the overall results of the mapping study in the EU-27 from both perspectives: i) the European regions with bioeconomy-relevant strategies (Section 3.1) and ii) the bioeconomy-relevant strategies identified in the European regions (Section 3.2).

3.1 European regions with bioeconomy strategic frameworks

Overall, in the EU-27 Member States there are 194 regions¹⁴ that have, or are working towards, a strategy relevant to the bioeconomy.

Of those 194 regions, 184 have seen strategies already published or adopted, while 10 regions are still working on a strategy or have a draft framework under development (see Table 1).

In absolute terms, Italy is the country with the largest number of regions with strategies related to the bioeconomy (21), followed by Sweden (20), France (18), Spain (17), Finland and Poland (16 each).

In the EU, 28 regions have published strategies fully dedicated to the bioeconomy, 62 regions have published strategies where the bioeconomy is one of the key elements, whereas 94 regions have strategies with minimum bioeconomy content¹⁵ (see Table 2).

Table 1 European regions per country with bioeconomy strategies and their geographical (NUTS) level

Country	Regions with published strategic frameworks	Regions with strategic frameworks under development	Regions with strategic frameworks TOTAL	Pre-dominant NUTS level of strategic frameworks per country	Total number of regions per country*
AT	8	-	8	NUTS 2	9
BE	3	-	3	NUTS 1	3
BG	-	-	-	-	-
CY	-	-	-	-	-
CZ	11	-	11	NUTS 3	14
DE	13	-	13	NUTS 1	16 NUTS1 and 1 NUTS2 = 17
DK	4	-	4	NUTS 2	5
EE	-	-	-	-	-
EL	2	-	2	NUTS 2	13
ES	14	3	17	NUTS 2	19 NUTS2 and 1 NUTS3 = 20
FI	16	-	16	NUTS 3	19
FR	18	-	18	NUTS 1	13 NUTS1 and 5 NUTS2 = 18
HR	1	-	1	NUTS 3	21
HU	10	-	10	NUTS 3	20

¹⁴ See Section 2.4 on the definition of 'region' within the context of this study.

¹⁵ The methodology used for the classification of strategies according to the bioeconomy focus is explained in Section 2.3.

Country	Regions with published strategic frameworks	Regions with strategic frameworks under development	Regions with strategic frameworks TOTAL	Pre-dominant NUTS level of strategic frameworks per country	Total number of regions per country*
IE	7	-	7	NUTS 3	8
IT	19	2	21	NUTS 2	21
LT	1	-	1	NUTS 3	10
LU	-	-	-	-	-
LV	2	-	2	NUTS 3	6
MT	-	-	-	-	-
NL	5	-	5	NUTS 1	4 NUTS1 and 1 NUTS2 = 5
PL	15	1	16	NUTS 2	1 NUTS1 and 17 NUTS2
PT	7	-	7	NUTS 2	7 NUTS2 and 1 NUTS3 = 8
RO	7	-	7	NUTS 2	8
SE	16	4	20	NUTS 3	21
SI	-	-	-	-	-
SK	5	-	5	NUTS 3	8
Total	184	10	194	--	272

*NOTE: For each country, the number of regions at the dominant NUTS level was taken as a basis. In several cases (DE, ES, FR, NL, PL, PT) regions with strategic frameworks on a different NUTS level were added to get the total number of regions.

Table 2 No. of European regions with bioeconomy strategies per role of the bioeconomy and status

Regions with a dedicated bioeconomy strategy		Regions with strategies where the bioeconomy is one of the key elements		Regions with strategies with minimum bioeconomy content		Total Number of Regions
Published	Under development	Published	Under development	Published	Under development	
28	1	62	7	94	2	194

EU-wide overview

The analysis shows that 6 countries, namely, Finland, France, Italy, Poland, Spain and Sweden are undertaking intense, regional, strategic action to deploy the bioeconomy¹⁶. In these large countries, many regions have more than one bioeconomy-relevant strategy¹⁷.

At the same time, there are 15 additional countries in which the bioeconomy is deployed to some extent at regional level. In each of these countries, at least one region has a bioeconomy-relevant strategy. The number of regional bioeconomy strategies per country is between 1 and 17. These countries are: Austria, Belgium, Croatia, Czechia, Denmark, Germany, Greece, Hungary, Ireland, Latvia, Lithuania, the Netherlands, Portugal, Romania and Slovakia.

¹⁶ Intense means in this case a relatively high absolute number of bioeconomy-related strategies published or under development per country and many different regions with bioeconomy-related strategies.

¹⁷ See also Chapter 5 for a more detailed summary reports for all countries.

Finally, there are 6 EU Member States with no bioeconomy-relevant regional strategies; they are mostly smaller countries without regional administrative subdivisions – except Bulgaria. These countries are Bulgaria, Cyprus, Estonia, Luxemburg, Malta and Slovenia.

The comparison between countries in relative terms, i.e. considering the overall number of regions per country¹⁸ (see Figure 2), shows that in Belgium, France, Italy and the Netherlands, all the regions have bioeconomy-relevant frameworks. The share is also high for Austria (8 out of 9 NUTS2) and Sweden (20 out of 21 NUTS3).

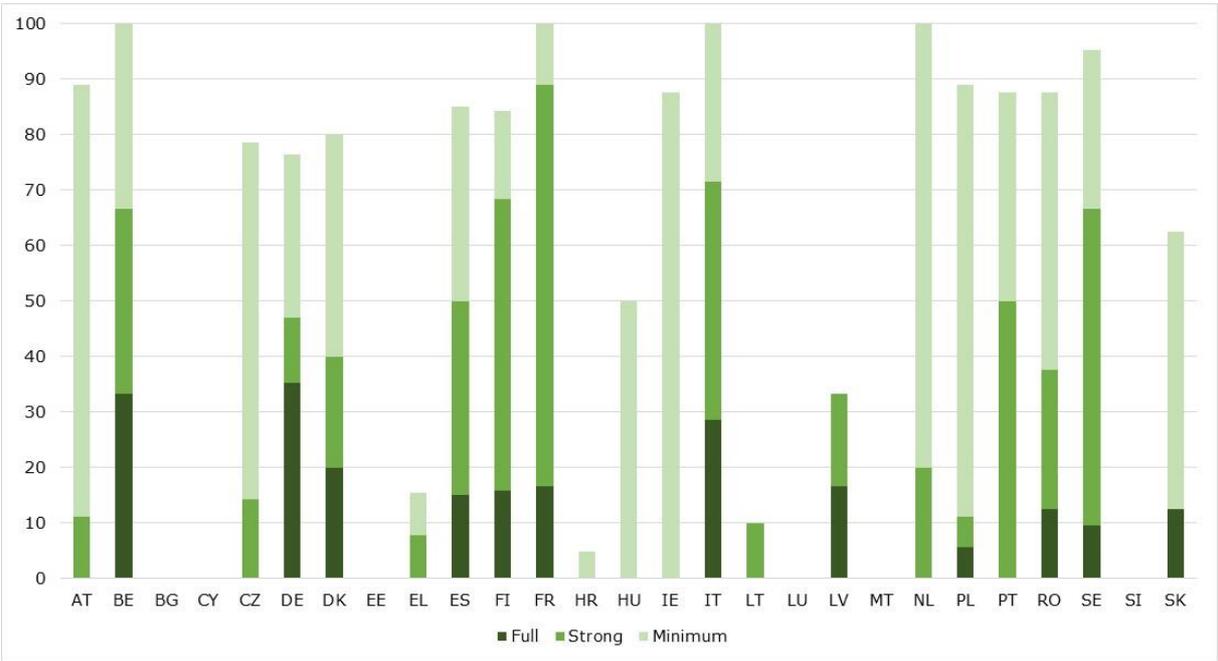
When only analysing the strategies with a more specific focus on bioeconomy (i.e. strategies fully dedicated to the bioeconomy or with bioeconomy as a key element), France (16 out of 18 regions), Finland (13/19), Italy (15/21), Belgium (2/3) and Sweden (14/21) have the highest shares.

Belgium (1/3), Germany (6/17) and Italy (6/21) have the highest shares of fully dedicated regional frameworks in their country.

In Austria (7/9), Czechia (9/14), Hungary (10/20), Ireland (7/8), Poland (14/17) and the Netherlands (4/5) the strategic frameworks with minimum bioeconomy content dominate, despite having a high share of regions with relevant strategies.

The comparison between countries has to be considered with caution, given the fact that different NUTS levels have been used for the analysis, depending on the countries' territorial and administrative structure and the level on which bioeconomy-relevant frameworks exist.

Figure 2 Share of regions per country with bioeconomy strategies by bioeconomy content



Note: This graph shows the percentage of regions with bioeconomy strategies compared to the overall number of regions in a given country at the predominant NUTS level, as shown in Table 1. In Germany, France, Poland, Portugal, Spain, the Netherlands and Sweden - strategies were also found at higher/lower NUTS level (in addition to the pre-dominant level of research). These additional cases were taken into account for the analysis.

¹⁸ As previously mentioned, for each country the number of regions at the dominant NUTS level was taken as a basis. In several cases (DE, ES, FR, NL, PL, PT), additional regions with strategies on a different NUTS level were added to get the total number of regions. See Table 1 for the number of regions considered in each country for the analysis.

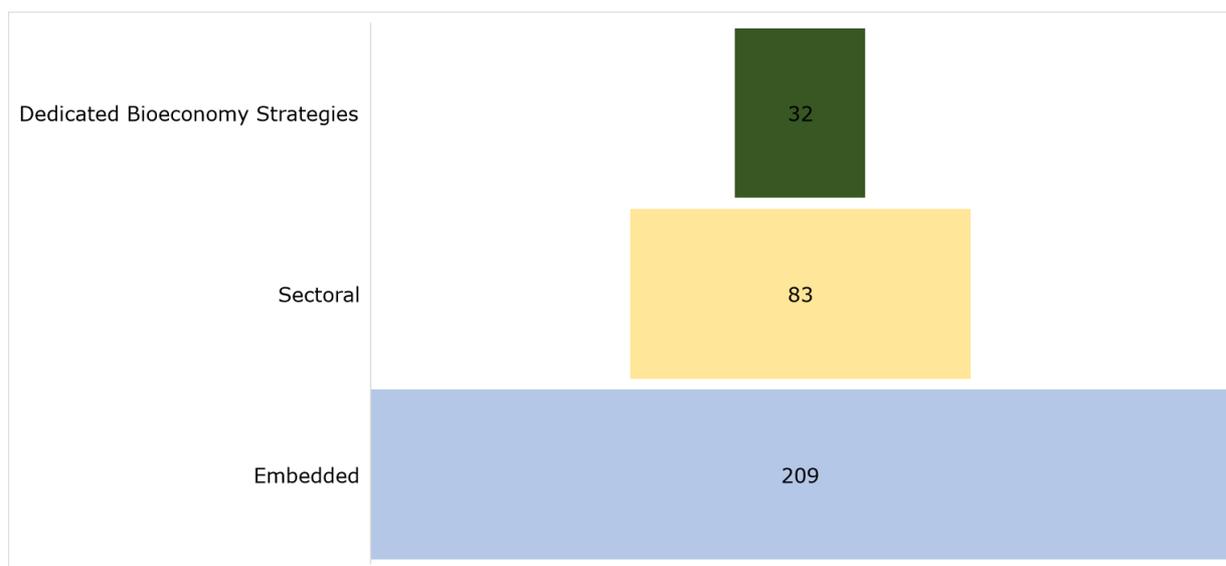
3.2 Regional bioeconomy strategies in Europe

Many European regions have multiple strategies in place, or under development, that are relevant to the bioeconomy or tackle it from different angles. This means that the number of bioeconomy strategies at regional level is considerably higher than the number of regions with bioeconomy strategies.

Research has revealed (Table 3) that there are 359 strategies (published and under development), at regional level in the EU-27 that are fully or partially dedicated to bioeconomy and contribute to its deployment across European regions (situation as of November 2021). Of these, 345 are strategies at (sub-national) regional or local level. In addition, 14 multi-regional strategies have been identified that cover different regions. Of these, 10¹⁹ have a cross-border, macro-regional or interregional perspective, while 4 cover various regions in one country²⁰.

Of the total 359 regional and interregional strategic frameworks, 334 are published (as of November 2021) (Table 4). Of these 334, 324 are regional and 10 are multi-regional strategic frameworks. Of these regional strategies, 32 are fully dedicated to bioeconomy, 83 cover bioeconomy within a sectoral strategy and 209 treat bioeconomy as an embedded topic within a wider strategic framework (Figure 3).

Figure 3 Regional strategies where bioeconomy is treated as a main theme, sectoral topic or is embedded in a wider strategic framework (no. of strategies)



Note: One region may be covered by several strategies.

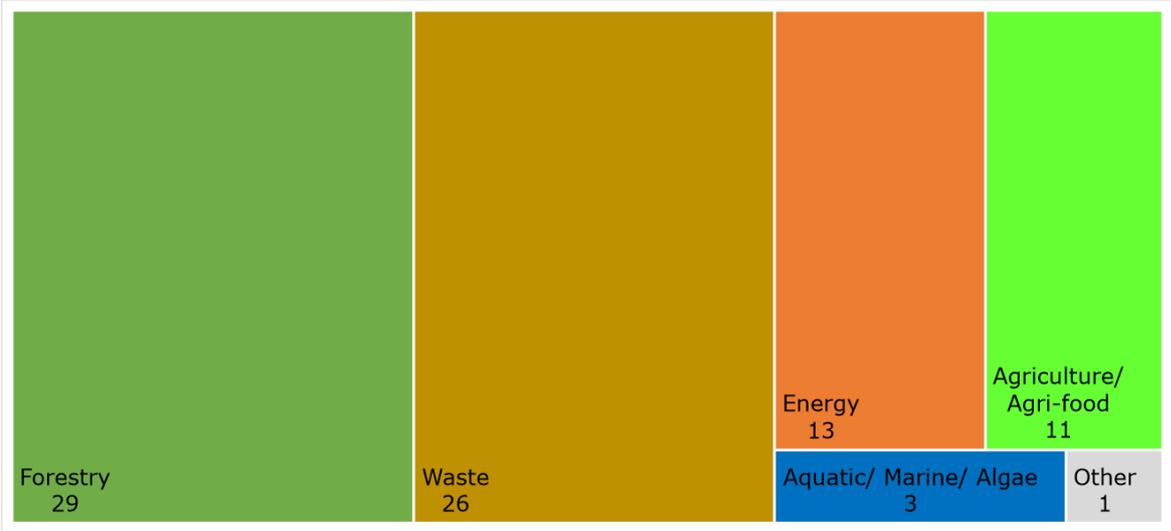
Overall, 41 strategies (32 regional and 9 multi-regional) are fully dedicated to the bioeconomy, i.e. directly focus on the deployment of the bioeconomy. Of those remaining, 97 strategies have a strong focus on the bioeconomy, whereas 196 have a minimum bioeconomy content.

Bioeconomy is addressed in sectoral strategies in 83 cases of the published regional strategies (Figure 4). In most cases, it is addressed in forestry plans/strategies (29), followed by waste plans (26), strategies on energy (13) or focusing on agriculture/agri-food (11). Bioeconomy is addressed in sectoral strategies on aquaculture/fisheries or algae (3) or on construction (1) in several cases.

¹⁹ See Section 5.4 for more detail on the macro- and interregional strategies covering regions from different countries.

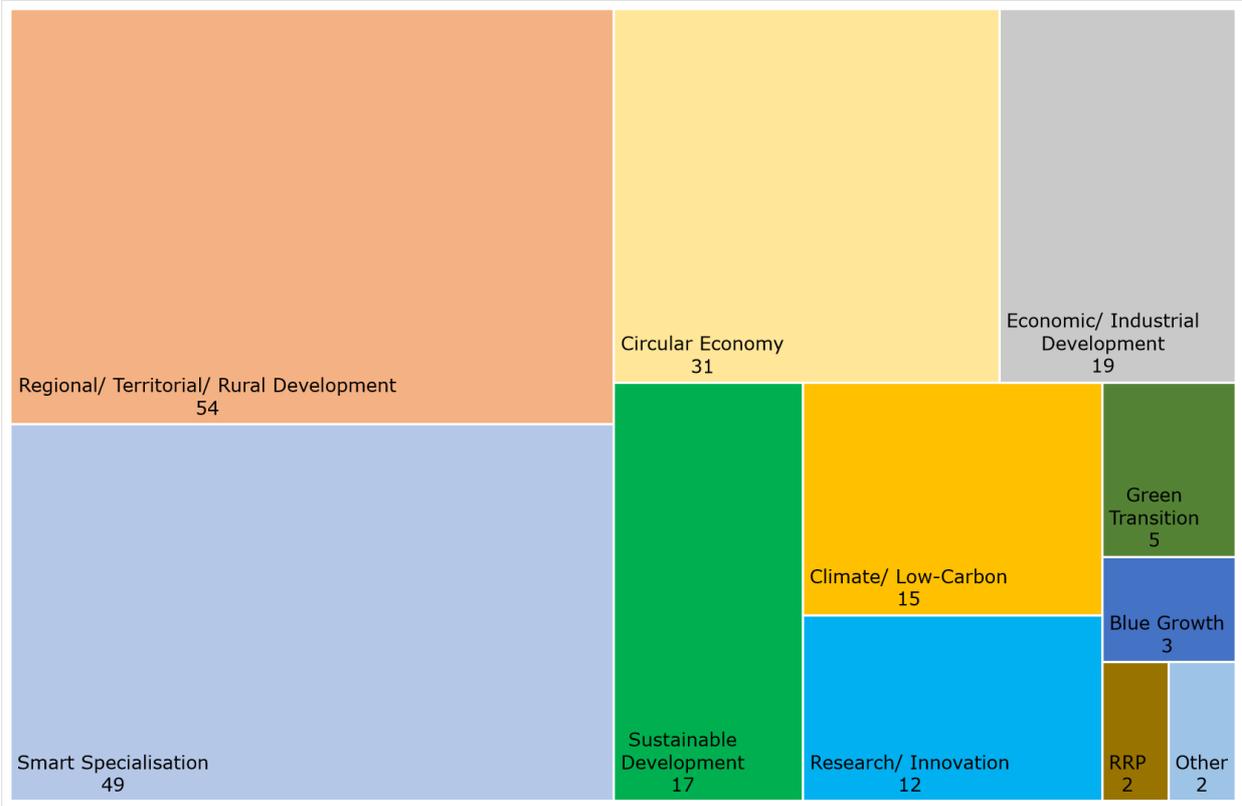
²⁰ These are Zuid-Holland (NL), Metropolregion Frankfurt (D), Pinhal Interior (PT) and Småland med öarna (SE).

Figure 4 Bioeconomy covered in sectoral strategies (no. of strategies per sector)



In 210 cases (209 regional and 1 macro-regional), bioeconomy is embedded into wider strategic frameworks (Figure 5). This is mostly the case within regional/territorial or rural development plans (54), within Smart Specialisation Strategies (49), within the context of circular economy strategies (31), within strategies for economic/industrial development (19) or sustainable development strategies/plans (17), within climate/low-carbon plans (15), and within regional research/innovation strategies (12). In several cases, bioeconomy is part of green (5) or blue transition (3) strategies or of recent Recovery and Resilience Plans (RRP) at regional level (2).

Figure 5 Bioeconomy embedded in wider strategies (no. of strategies per theme) (*RRP = Recovery and Resilience Plan)



Patterns

Certain patterns per country could be observed, e.g. how and in which wider frameworks bioeconomy is embedded. For example, in Spain and Portugal, the bioeconomy is often included in circular economy strategies, while in Italy it is typically addressed within sustainable development strategies. In Finland, bioeconomy is covered in almost every Regional Development Plan and in many Smart Specialisation strategies, but also often in climate plans. In Poland, it can be found in Regional Development Plans or research/innovation strategies, whilst in Hungary it was only identified in territorial development plans.

The administrative level where bioeconomy strategies exist largely depends on the administrative organisation of the different countries and which regional level has the legal competence to develop regional strategies. For example, most strategies in Germany and France exist at NUTS 1 level, most strategies in Denmark, Spain or Poland at NUTS 2 level, whereas strategies in Finland, Sweden and Hungary mostly exist at NUTS 3 level.

Belgium is a specific case and the only country where the bioeconomy is not treated as a national competence but directly as a regional competence field. This is the reason why there is no national strategy but strategies in each of the regions.

The existence of regional bioeconomy strategies primarily depends on two factors. First, if the country is large and decentralised, then it is likely that strategies related to bioeconomy exist at regional level. One exception is Bulgaria, where regional strategies could not be found, despite being a large country. For the smallest EU countries (Luxembourg, Malta, Cyprus), no regional frameworks were identified. Second, where a strategy for bioeconomy exists at national level, it may be considered sufficient also for regional and local action and, consequently, fewer (dedicated) documents may exist at regional level. This is the case in Finland and Germany where there are important strategies at national level. In this case, bioeconomy at sub-national level is mostly embedded in wider strategic frameworks. However, even if a national strategy exists, there can still be regional strategies to further specify actions (e.g. in the case of France and Portugal).

In addition to regional level, a limited number of strategies could be identified at local level²¹. As this type of strategies was not the focus of the study, data for such strategies should be considered partial: more bioeconomy strategies at local level, even at urban or metropolitan level may exist.

It must be noted that the European Territorial Cooperation Programmes – Interreg - play an important role in developing regional and, especially, multi-regional bioeconomy strategies. Interreg projects are often mentioned as the origin of regional strategic frameworks or action plans in countries without systematic deployment of the bioeconomy at regional level. They are the motor behind all multi-regional bioeconomy strategies identified during the study. The BIOEAST Initiative plays a similar role, with considerable involvement at national level. BIOEAST promotes bioeconomy development, especially in countries where bioeconomy deployment is less advanced, namely in 11 central and eastern European countries. BIOEAST is supported by the European Union's Horizon 2020 Programme for Research and Innovation.

²¹ The term 'local level' is of course relative, depending on the country and geographical scale. During this study it has been used to describe the administrative territorial level that is below the 'regional' level on which the desk research concentrated. Examples of local-level strategic frameworks identified are the strategy for the metropolitan region of Frankfurt in Germany, the strategy for the metropolitan area of Porto in Portugal or the strategy for Klaipėdos apskritis in Lithuania.

Table 3 Overview of regional bioeconomy strategies in the EU27 – Strategies per country (published and under development)

	Fully dedicated bioeconomy strategies	Sectoral						Embedded into											TOTAL
		Forestry	Agriculture/ Agri-food	Energy	Waste	Aquatic/ Marine/ Algae	Other	Smart Specialisation	Regional/ Territorial/ Rural Development	Circular Economy	Sustainable Development	Climate/ Low-Carbon	Economic/ Industrial Development	Green Transition/ Green growth	Blue Growth	Research/ Innovation	Recovery and Resilience Plan	Other	
AT					6						1		3			3			13
BE	3		1	1				2	1	3	1	3							15
BG																			0
CY																			0
CZ				4				2	7			2				2			17
DE*	7							7			2		1						17
DK	1			3							1			2					7
EE																			0
EL								1		2									3
ES	3	7	3	1	3	2		3		13			1	1	3		2		42
FI	3	3		1				12	8	2	1	6		1				1	38
FR	3	3	6	4	2	1	1	1		4		1	8						34
HR										1									1
HU									10										10
IE		6	1										3						10
IT	6							9		1	20			1					37
LT								1											1
LU																			0
LV	1										1								2
MT																			0
NL*	1							4					1						6
PL	1		1	1	14				7							8			32
PT*					1			2	2	7									12
RO	1							5	2										8
SE*	2	15						2	16	1		2	1						39
SI																			0
SK	1								1			1	1					1	5
SUB-TOTAL	33	34	12	15	26	3	1	51	54	34	27	15	19	5	3	13	2	2	349
OTHER	9							1											10
TOTAL	42	34	12	15	26	3	1	52	54	34	27	15	19	5	3	13	2	2	359

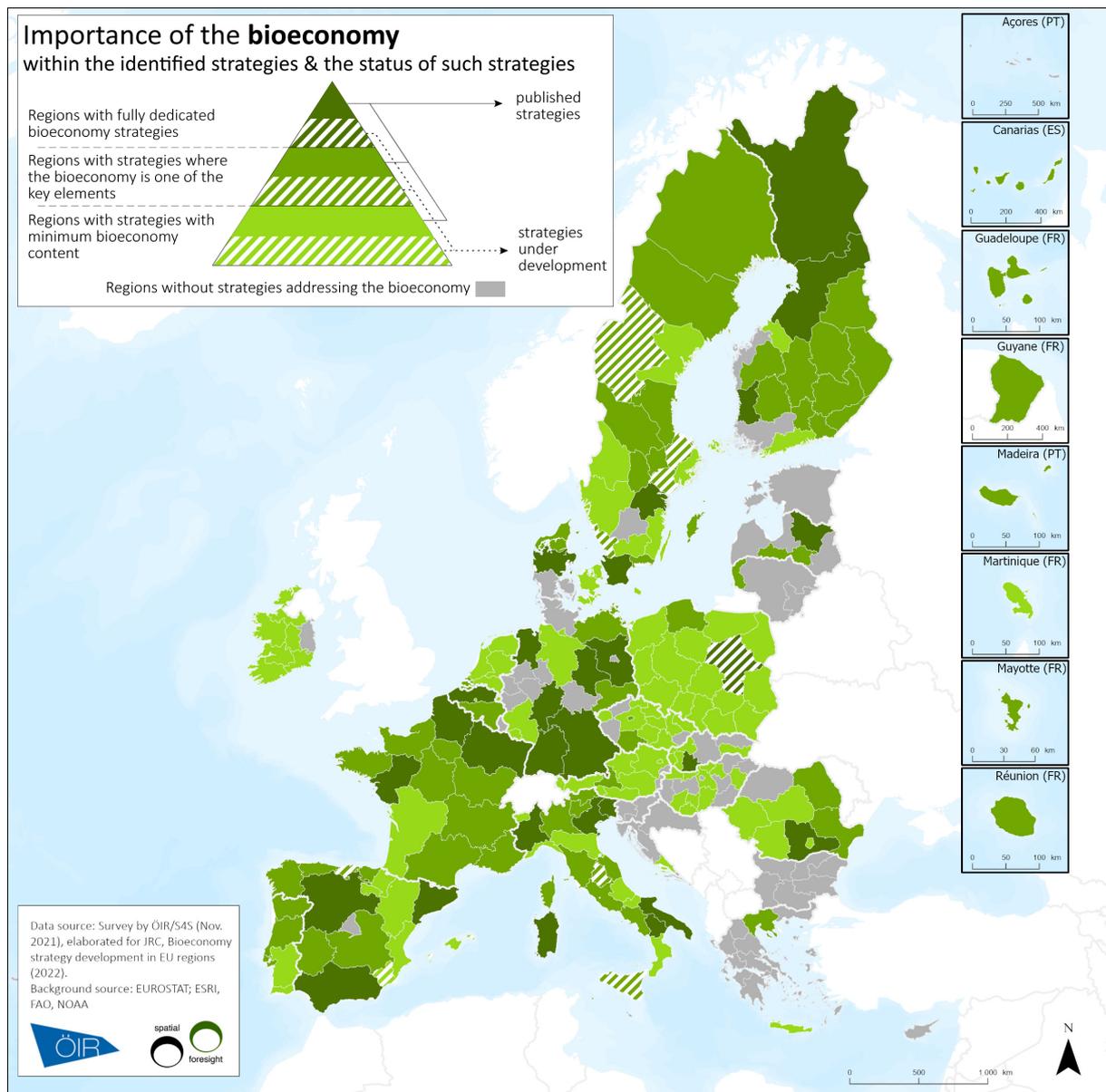
* In Germany, the Netherlands, Portugal and Sweden, there is one strategy in each country that could not be assigned to one region (one NUTS code) as it covers various regions in the country. These 4 multi-regional strategies are included in this overview table, but not in the analysis per region.

Table 4 Overview of regional bioeconomy strategies in the EU27 – Strategies per country (published)

	Fully dedicated bioeconomy strategies	Sectoral						Embedded into										TOTAL	
		Forestry	Agriculture/ Agri-food	Energy	Waste	Aquatic/ Marine/ Algae	Other	Smart Specialisation	Regional/ Territorial/ Rural Development	Circular Economy	Sustainable Development	Climate/ Low-Carbon	Economic/ Industrial Development	Green Transition/ Green growth	Blue Growth	Research/ Innovation	Recovery and Resilience Plan		Other
AT					6						1	3				3			13
BE	3		1	1				2	1	3	1	3					3		15
BG																			0
CY																			0
CZ				4				2	7			2				1			16
DE*	7							7			2	1							17
DK	1			2							1			2					6
EE																			0
EL								1		2									3
ES	3	6	2	1	3	2		2		10		1	1	3			2		36
FI	3	3						12	8	2	1	6	1					1	37
FR	3	3	6	4	2	1	1			4		1	8						33
HR										1									1
HU									10										10
IE		6	1									3							10
IT	6							9		1	10		1						27
LT								1											1
LU																			0
LV	1										1								2
MT																			0
NL*	1							4				1							6
PL			1	1	14				7							8			31
PT*					1			2	2	7									12
RO	1							5	2										8
SE*	2	11						2	16	1		2	1						35
SI																			0
SK	1								1			1	1					1	5
SUB-TOTAL	32	29	11	13	26	3	1	49	54	31	17	15	19	5	3	12	2	2	324
OTHER	9							1											10
TOTAL	41	29	11	13	26	3	1	50	54	31	17	15	19	5	3	12	2	2	334

* In Germany, the Netherlands, Portugal and Sweden, there is one strategy in each country that could not be assigned to one region (one NUTS code) as it covers various regions in the country. These 4 multi-regional strategies are included in this overview table, but not in the analysis per region.

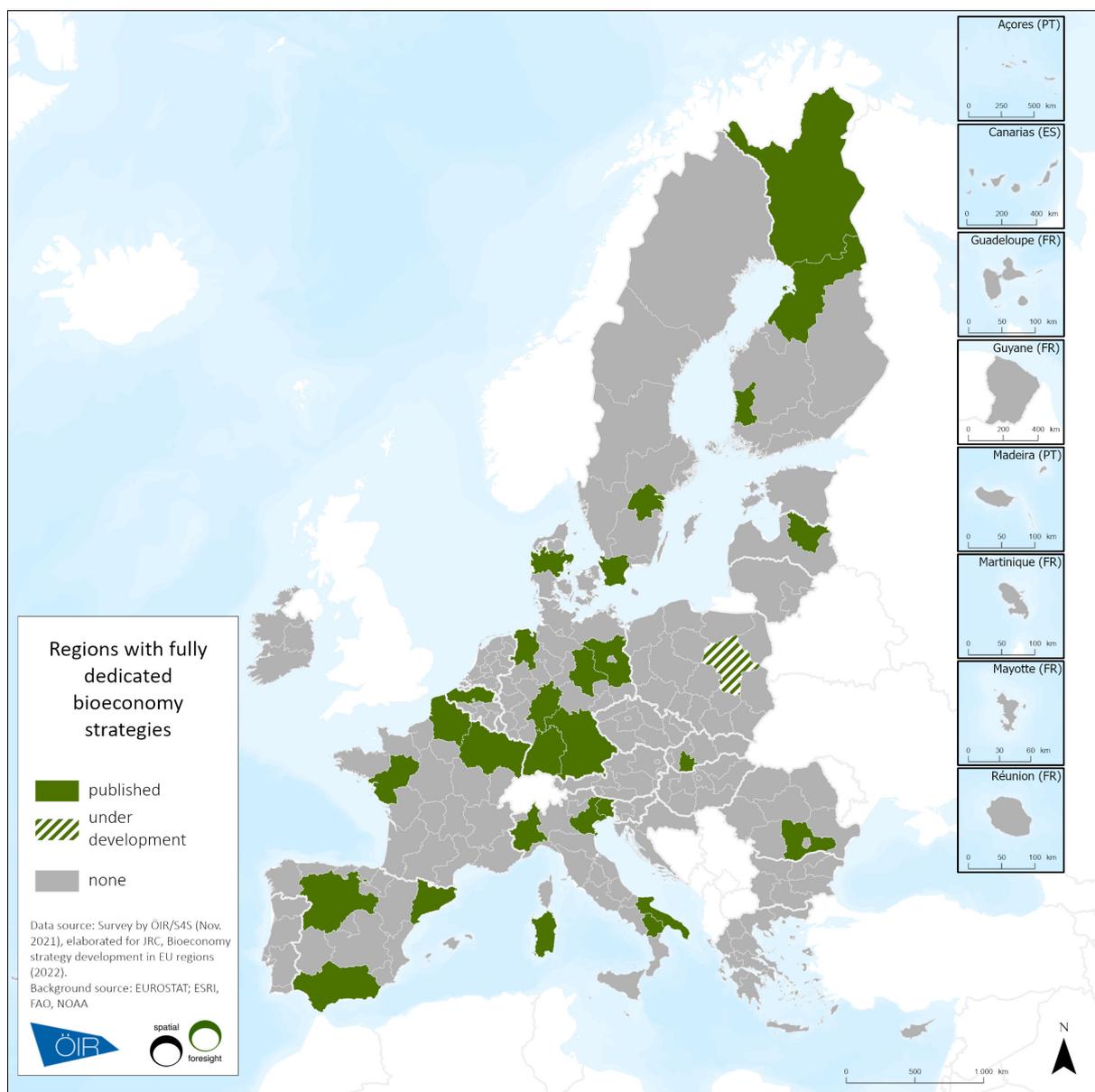
Map 1 EU regions with bioeconomy strategies



Note: Some regions have multiple strategies related to the bioeconomy. On this map, regions appear only with the strategy that is ranked highest in the strategy pyramid (see map legend). Regions covered by multiple regional strategies at different NUTS levels appear only with the strategy that is ranked highest in the strategy pyramid (e.g. a NUTS 3 region, with a strategy of minimum bioeconomy content, that is part of a NUTS 2 region with a strategy where the bioeconomy is one of the key elements, appears under the NUTS 2 region. On the other hand, a NUTS 3 region, with a strategy where the bioeconomy is one of the key elements and which is part of a NUTS 2 region with a strategy of minimum bioeconomy content, is shown separately). The existence of other strategies in a specific region can be seen on Maps 2-4.

Disclaimer: National or cross-country/cross-regional strategies are not represented on the maps.

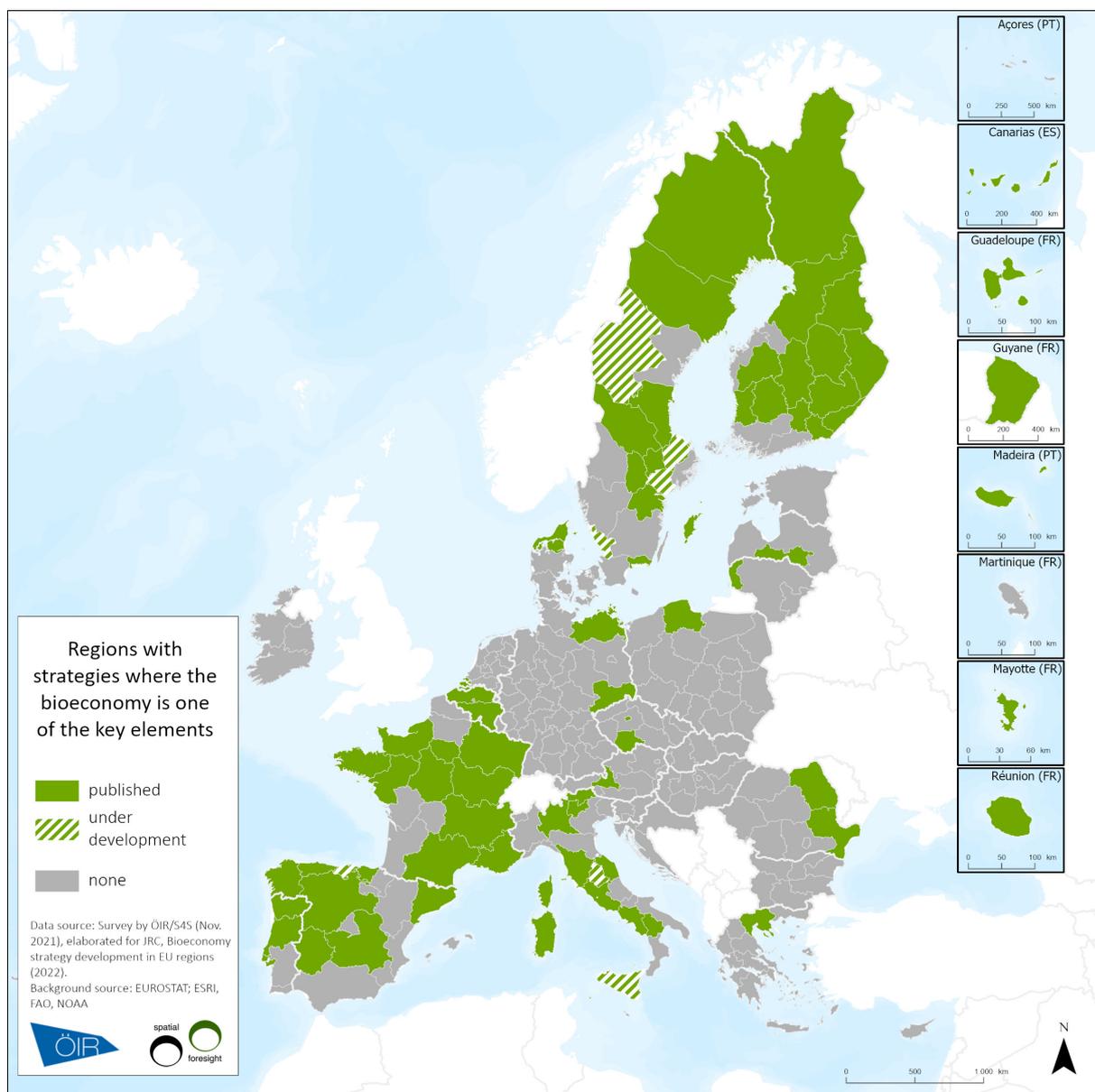
Map 2 EU regions with fully dedicated bioeconomy strategies (published/under development)



Note: Some regions have multiple strategies related to the bioeconomy, so regions may appear on different maps, e.g. fully dedicated and strong focus.

Disclaimer: National or cross-country/cross-regional strategies are not represented on the maps.

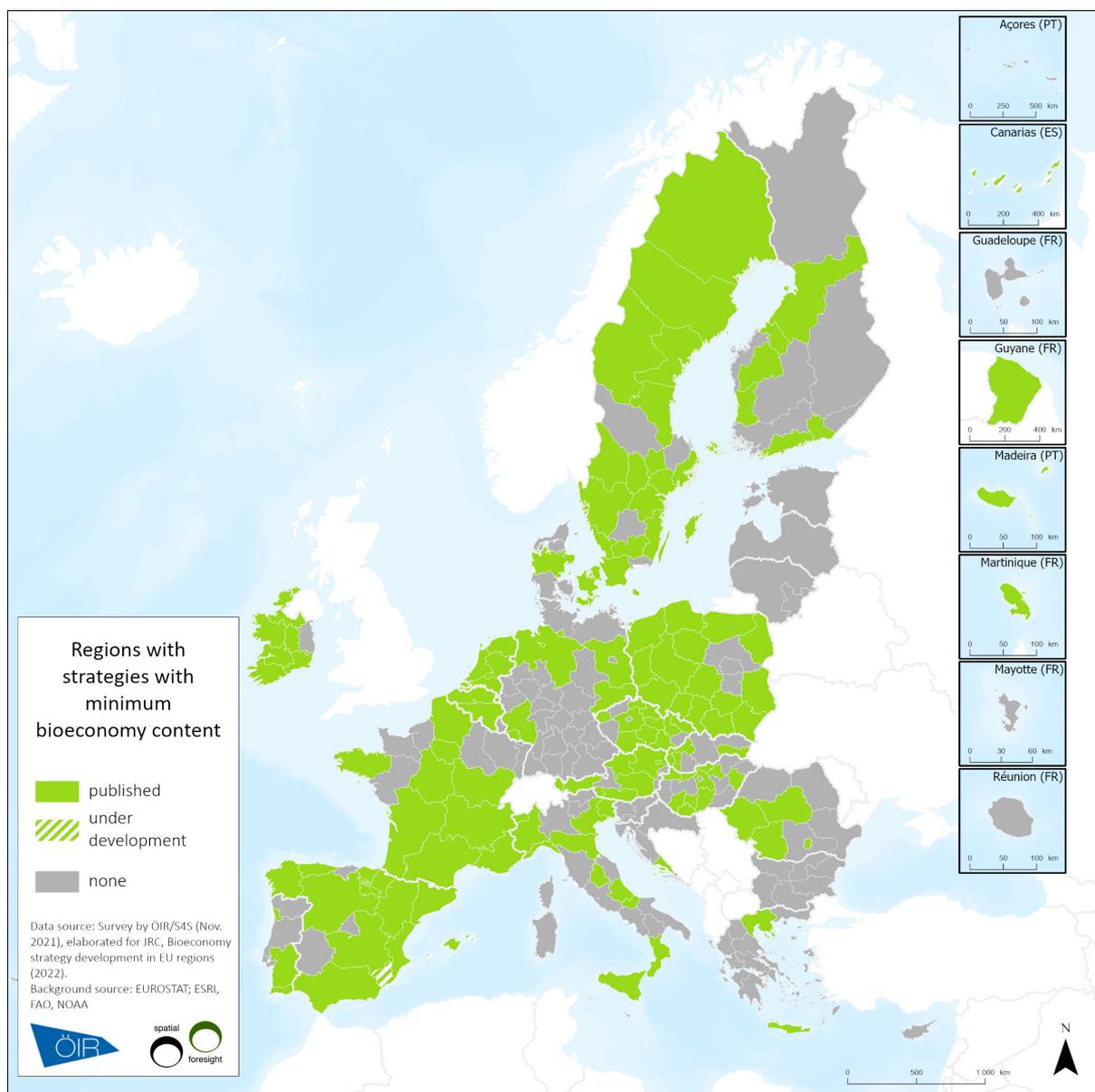
Map 3 EU regions with strategies where the bioeconomy is one of the key elements (published/under development)



Note: Some regions have multiple strategies related to the bioeconomy, so regions may appear on different maps, e.g. fully dedicated and strong focus.

Disclaimer: National or cross-country/cross-regional strategies are not represented on the maps.

Map 4 EU regions with strategies with minimum bioeconomy content (published/under development)



Note: Some regions have multiple strategies related to the bioeconomy, so regions may appear on different maps, e.g. fully dedicated and strong focus.

Disclaimer: National or cross-country/cross-regional strategies are not represented on the maps.

4 Analysis of commonalities and divergences

This chapter examines some commonalities and divergences between regional strategies across the EU, based on their general characteristics.

If not stated otherwise, the analysis is based on the 349 regional bioeconomy strategies (published and under development) identified²². It covers the three strategy categories according to the bioeconomy focus, i.e. dedicated strategies, strategies with a strong bioeconomy focus and strategies with minimum bioeconomy-related content.

The analysis gives insights into:

- the main objectives stated in the strategies
- the documents' year of publication
- the sectors covered
- the biomass resources addressed
- the policy measures proposed.

²² The 10 bioeconomy-relevant strategies with a cross-border, macro-regional or interregional perspective were not included into this analysis since they differ from regional strategies (e.g. regarding content and level of detail) and thus cannot be directly compared to them.

4.1 Main strategic objectives

The EU Bioeconomy Strategy²³ defines five objectives: ensuring food and nutrition security; managing natural resources sustainably; reducing dependence on non-renewable resources; mitigating and adapting to climate change; and strengthening European competitiveness and creating jobs. The analysis investigated which of these objectives are pursued by the regional strategies. The most prominent objectives of the different strategies are outlined below.

Figure 6 shows the strong emphasis of all regional bioeconomy strategies on the sustainable management of natural resources (within 270 of 349 strategies, 77%).

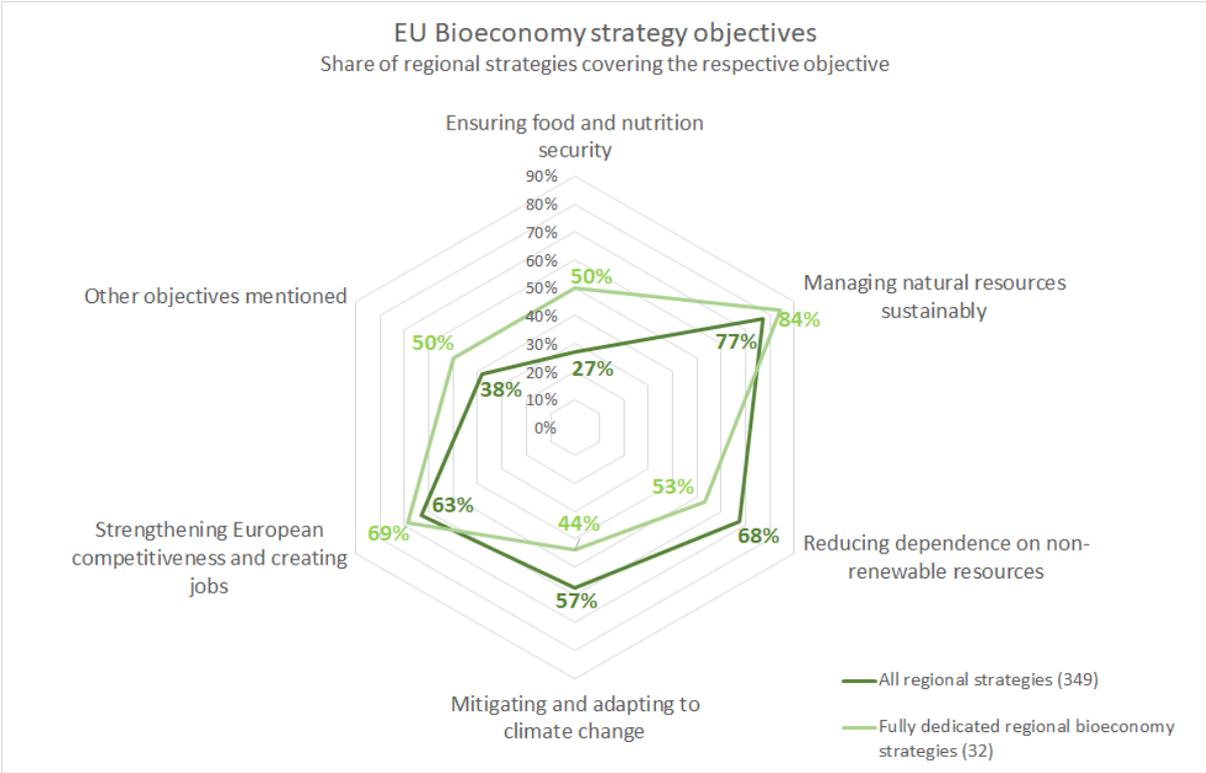
Reducing the dependence on non-renewable resources is also one of the most extended goals of the regional strategies (236 or 68% of the strategies). Evidently, many strategies, especially those where bioeconomy is embedded in Smart Specialisation or economic strategies, refer to the aim of strengthening the competitiveness of the regions and creating jobs (220 or 63%)

Furthermore, most strategies are also aligned with Europe’s overall goal of mitigating and adapting to climate change (200 or 57%), which is often inherent to the use of bioeconomy resources.

Less than one third of the strategies mentions ensuring food and nutrition security as a dedicated goal (95 or 27%).

The picture hardly changes if the analysis is limited to those strategies with a strong bioeconomy focus and the dedicated regional bioeconomy strategies. One difference that can be observed is that fully dedicated strategies pay greater attention to nutrition and food security (16 out of 32 strategies, 50%) than the average of all strategies analysed.

Figure 6 EU Bioeconomy strategy objectives in regional strategies (% of strategies)



²³ European Commission 2018a

4.2 Publication year

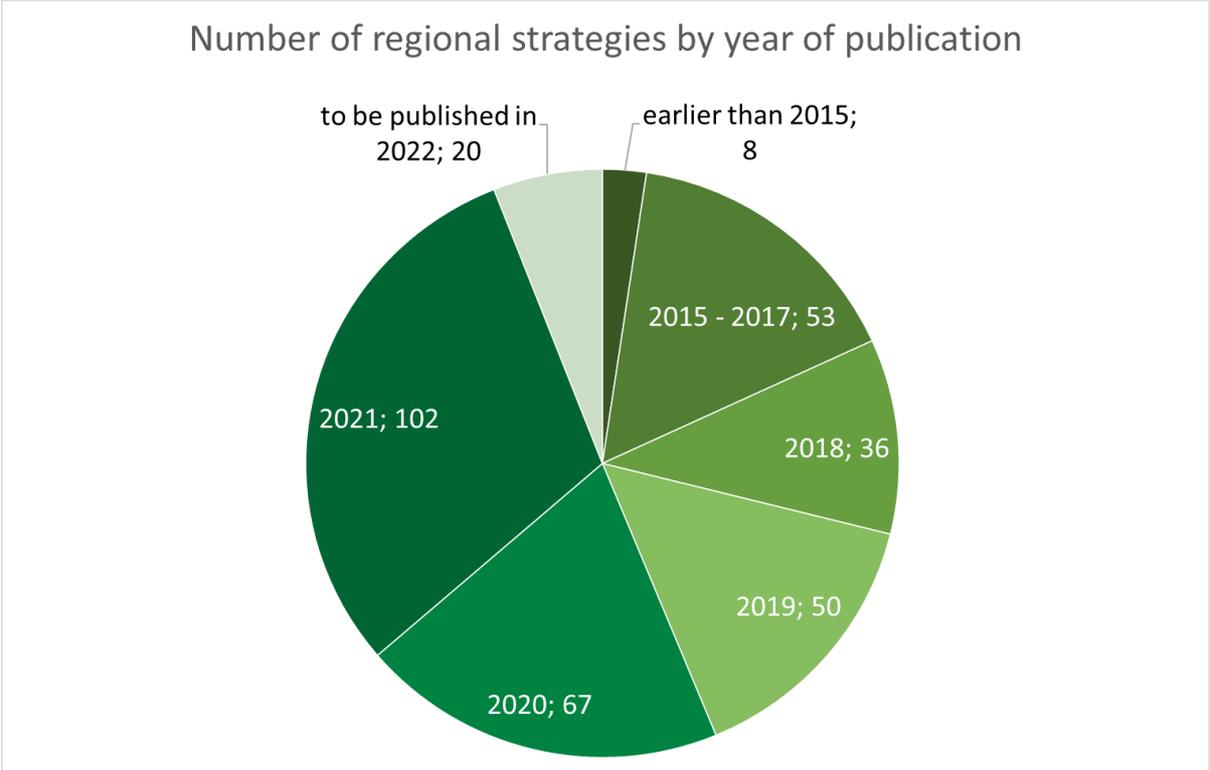
Most of the strategies analysed were published in recent years. Figure 7 shows that half of the strategies were published in the period 2020-2021. In particular, the high number of strategies published in 2021 is remarkable. This may be due to the fact that a new Multiannual Financial Framework starts in 2021 and that many regional strategies are aligned with the time frame of the new EU programmes (2021-2027).

In contrast, only 2% of the strategies were published before 2015. It should be noted, however, that documents from that period were included in the analysis only if they were still valid and referred to by the regional authorities and new documents were not yet available.

Furthermore, 20 strategies (6%) included in the research were draft versions to be published in 2022.

It must be noted that the mapping was completed in November 2021. By that date, a number of Smart Specialisation strategies with bioeconomy content were still at early stages of development and could not be accounted by the research team. It is expected that more regional documents related to bioeconomy will be published in 2022 or in the coming years.

Figure 7 Number of regional strategies by year of publication

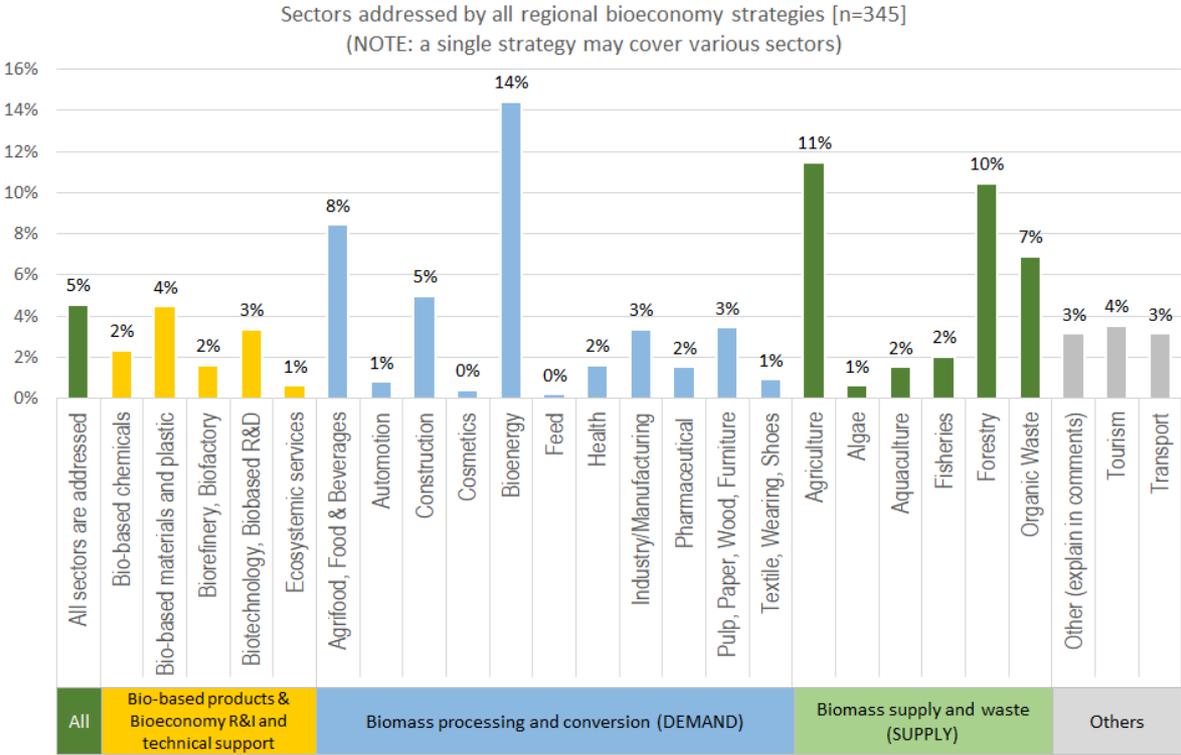


4.3 Sectors

The sectors addressed by the regional bioeconomy strategies can be grouped into sectors that supply biomass (supply) and sectors that require biomass to convert it into intermediate or end products (demand). Some bioeconomy strategies aim at enhancing the value added by the bioeconomy sectors in their regions, e.g. by establishing certain educational institutions in order to attract processing industries to their regions, producing bio-based products.

According to our analysis, one third of the sectors addressed concerns the supply side, mostly agriculture and forestry, but also organic waste. Fisheries and aquaculture are included in fewer strategies, presumably due to the geography of the regions. Another third of the sectors addressed relates to biomass processing and conversion, often related to bioenergy, agri-food or construction. Sectors linked to bio-based products (plastics, biorefinery products, etc.) or bioeconomy research are mentioned less frequently, mostly in cases where bioeconomy is embedded in regional energy strategies. Other sectors such as tourism and transport are rarely mentioned in the strategies analysed.

Figure 8 Sectors addressed by regional bioeconomy strategies (NOTE: A single strategy may cover multiple sectors)



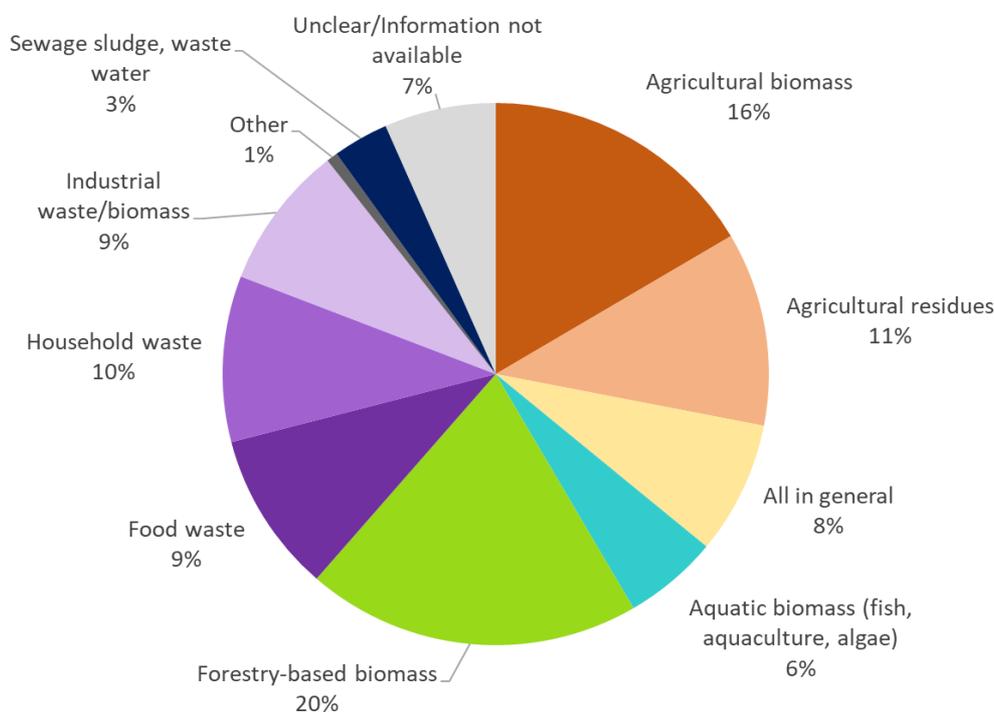
4.4 Biomass resources

The different biomass resources addressed by published dedicated regional bioeconomy strategies and regional strategies with a strong bioeconomy focus are illustrated in Figure 9.

Forestry-based biomass is most often part of the strategies (20%) as well as agricultural biomass (16%) and agricultural residues (11%).

Furthermore, different forms of waste (food, organic household and industrial waste) are frequently addressed in the strategies (28%), not simply by circular economy strategies and waste management plans. Aquatic biomass is addressed in considerably fewer strategies (6%).

Figure 9 Diversity of biomass resources addressed in dedicated and regional strategies where bioeconomy is a key element (NOTE: A single strategy may address multiple types of resources) [n=90 strategies]



Map 5 illustrates the geographic pattern of biomass resources addressed in regional strategies. If at least one of the strategies in a region addresses a certain biomass resource, it is shown in the pie chart for the region.

Regions addressing different types of biomass resources in general, without any further specification, are shown by the yellowish coding. They can be found in Germany (Mecklenburg-Vorpommern, Weser-Ems), Spain (Andalucía), Portugal (Centro, Madeira) and France (Bretagne).

The only region addressing all five types of biomass resources is Vlaams Gewest in Belgium.

Forestry-based biomass is an important resource in the widely forested areas of Sweden and Finland, where this biomass resource is frequently the strategies' only focus.

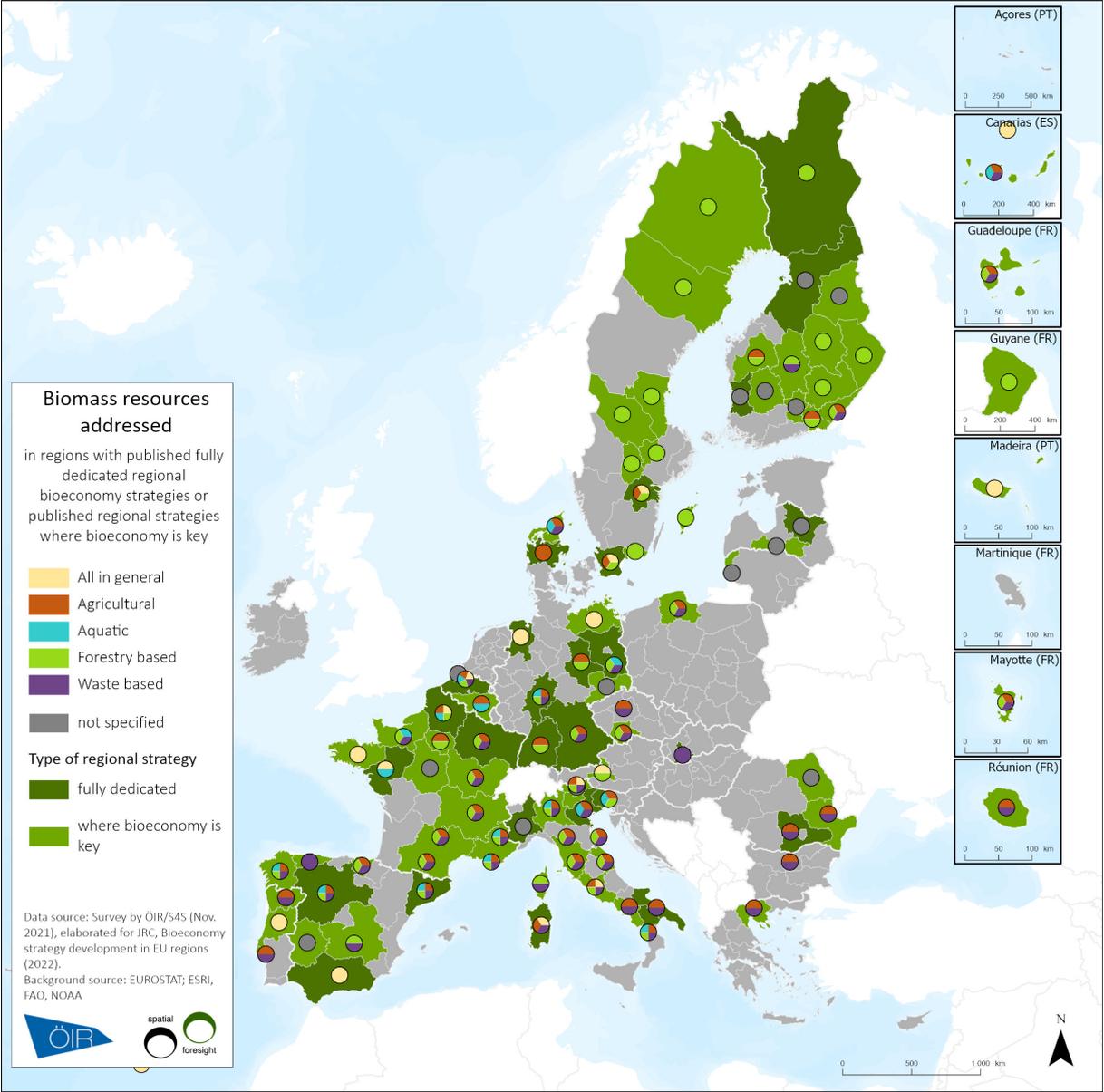
Most interestingly, forests as a biomass source are not mentioned in strategies of other heavily forested regions, e.g. in Romania or Slovakia and only in Jihočeský kraj of Czechia. The reason behind this may be that forest strategies are situated at national level or at the level of the forest owners. This does not mean that there are no other initiatives at regional

level. For example, in Styria, a heavily forested area of Austria, the cluster management dedicated to wood-based production is very active.

As previously stated, agricultural biomass and residues are addressed by many regional strategies, as well as waste-based biomass resources.

Aquatic biomass (fish, aquaculture, algae) is primarily addressed in coastal regions in Spain (Galicia, Castilla y León, Cataluña and the Canarias) and France (Normandie, Nord-pas-de Calais-Picardie, Pays de la Loire, Provinces-Alpes-Cote d’Azur), but also in Belgium (Vlaams Gewest), Denmark (Nordjylland) and Italy (Veneto, Friuli-Venezia Giulia, Basilicata). However, there are also continental regions addressing aquatic biomass, for example in Belgium (the Region Wallonne) or in Germany (Brandenburg, Hessen).

Map 5 Biomass resources addressed in regions with published, fully dedicated regional bioeconomy strategies or strategies where bioeconomy is a key element



4.5 Policy measures

The types of policy measures included in regional bioeconomy strategies is widespread, as shown Figure 10. The figure refers to the 345 strategies identified at sub-national level, but a single strategy may include multiple policy measures. It must be considered that specific information on policy measures was not available for all strategies, i.e. in 112 cases no explicit information on the policy measures linked to the strategy was available.

The policy measures most frequently cited in the regional strategies are related to funding of R&I (in 173 strategies or 22%) and governance (in 171 strategies or 21%). These policy measures can be found in regional strategies all over Europe.

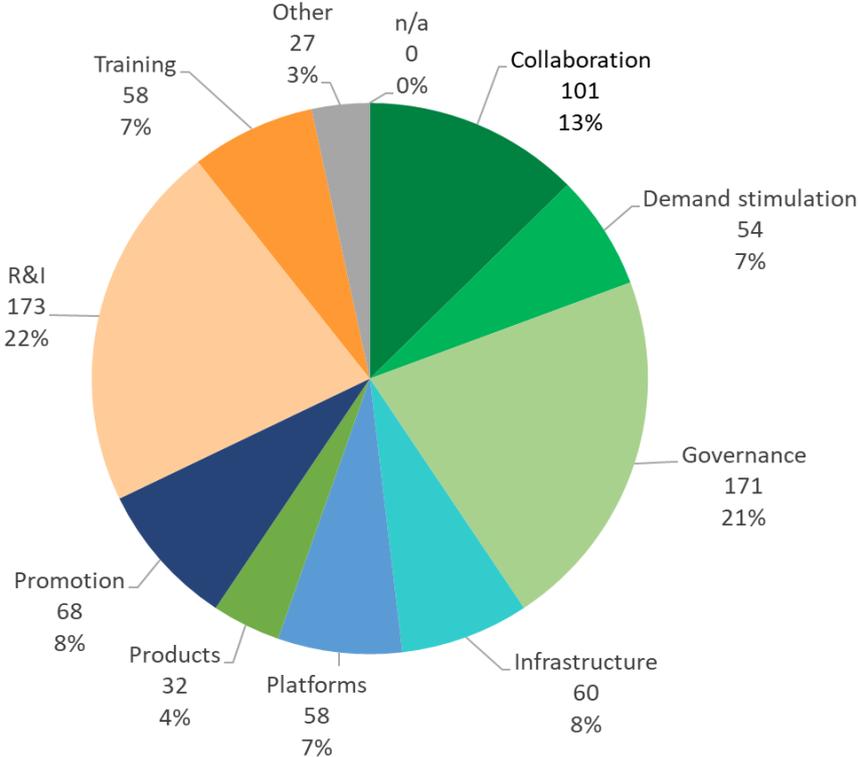
The governance measures included aim at ensuring policy coherence across sectors, actors, governance levels and timeframes (75 citations of 171). In addition, further monitoring and reporting measures are often included in the strategies.

Policy measures targeting collaboration, be it the facilitation of bottom-up initiatives or measures to enable multi-stakeholder involvement and dialogue, are stated in a large share of policy documents (101 strategies or 13%).

Other important policy measures indicated are:

- promotion measures aim at raising awareness and providing information on the bioeconomy (in 68 strategies or 8%),
- infrastructure, i.e. the promotion of bioeconomy-specific research centres (or units) as well as pilot and demonstration facilities (in 60 strategies or 8%),
- training measures (in 58 strategies or 7%),
- support for stimulating demand includes new legal provisions, public procurement as well as labels, certification or standards (in 54 strategies or 7%).

Figure 10 Policy measures included in regional bioeconomy strategies (NOTE: A single strategy may include multiple policy measures)



5 Short summary per EU Member State

The results per EU Member State are presented below. The situation concerning deployment of bioeconomy-related strategies across the EU is very diverse, ranging from countries with no bioeconomy strategies existing at regional level to countries with multiple regional strategies related to bioeconomy for all or most of their regions.

Country-specific results are presented in a common format. Due to significant differences in the availability and abundance of information for different countries, the EU Member States are grouped into three clusters presented in respective sections:

- countries with no bioeconomy-relevant regional strategies: Bulgaria, Cyprus, Estonia, Luxemburg, Malta, Slovenia,
- countries with regional strategic action to deploy bioeconomy (between 1 and 15 regions with bioeconomy-relevant strategic frameworks): Austria, Belgium, Czechia, Germany, Denmark, Greece, Croatia, Hungary, Ireland, Lithuania, Latvia, the Netherlands, Portugal, Romania, Slovakia,
- countries with intense regional strategic action to deploy bioeconomy (more than 15 regions with bioeconomy-relevant strategies and usually more than one strategy per region): Spain, Finland, France, Italy, Poland, Sweden.

Finally, macro- and interregional strategies (i.e. strategic frameworks that cover several regions in one country or in different countries) are presented in Section 5.4.

Table 5 Groups of countries and strategies presented in chapter 5

Section 5.1 Countries with no bioeconomy-relevant regional strategies	Section 5.2 Countries with moderate regional strategic action to deploy bioeconomy	Section 5.3 Countries with intense regional strategic action to deploy bioeconomy	Section 5.4 Other
Bulgaria Cyprus Estonia Luxembourg Malta Slovenia	Austria Belgium Czechia Germany Denmark Greece Croatia Hungary Ireland Lithuania Latvia The Netherlands Portugal Romania Slovakia	Spain Finland France Italy Poland Sweden	Macroregional, cross-border and interregional bioeconomy-relevant strategies

5.1 Countries with no bioeconomy-relevant regional strategies

There are six Member States, mostly smaller countries, with no bioeconomy-relevant strategic frameworks at regional level.

5.1.1 Bulgaria

According to the results of this study, there are neither national nor regional published bioeconomy strategies in Bulgaria at the time of this mapping in Bulgaria. However, Bulgaria participates in the BIOEAST Initiative and is currently developing a strategy for 'Strengthening the Role of the Agricultural Sector in the Bioeconomy' and the 'National Strategy for Transition to a Circular Economy'. The survey indicates that there is at least one regional bioeconomy strategy under development, i.e. in the Stara Zagora region (BG344). Due to the lack of official information and further details about it, the strategy mentioned is not accounted for in this mapping and in the corresponding database.

5.1.2 Cyprus

During the mapping, no documents could be found at regional level for Cyprus. Cyprus does not have a national bioeconomy strategy either. Bioeconomy is however, indirectly embedded in other policies to a rather small degree. There is a National Action plan for the strengthening of circular economy 2021-2027 (2021), in which features of the bioeconomy are included. The national plan of Cyprus for Energy and Climate (2020) does not directly address bioeconomy but reflects on biomass and biogas use for electricity production as a sustainable energy means. Forest/wood biomass and waste biomass are also mentioned.

5.1.3 Estonia

According to the mapping, Estonia does not have a bioeconomy strategy, neither at national nor at regional level. However, different strategic documents published by the government support the development of a bioeconomy related to forestry development, agriculture, food and fisheries. Those of most relevance are the '2014-20 Rural Development Plan'; the 'National Development Plan of the Energy Sector until 2030'; the 'Agriculture and Fisheries strategy 2030'; and the 'General Principles of Climate Policy until 2050'. Additionally, Estonia participates in the macroregional bioeconomy initiatives BIOEAST and Bioeconomy in the Baltic Sea Region.

5.1.4 Luxembourg

Luxembourg is a small country with no regional administration units. At national level, bioeconomy is mentioned in several strategic frameworks, for example the national Smart Specialisation Strategy (2017) and in the 'Strategy of the national Wood Cluster' (2018), created in 2016. An integration of bioenergy into a broader bioeconomy framework is mentioned as an objective of several projects and initiatives that exist in the country.

5.1.5 Malta

The results of the mapping indicate that Malta does not have a bioeconomy strategy. The most relevant document is Malta's 'Sustainable Development Vision for 2050'. This document covers all aspects of sustainable development. As such, several endeavours cover aspects related to the bioeconomy, even if the term itself is never mentioned. This document does not include information on concrete measures, budgets or monitoring mechanisms. Malta's strategy towards a circular economy is also relevant, but again, the term bioeconomy (or related terms) is not mentioned.

5.1.6 Slovenia

According to the mapping, there are no bioeconomy strategies at regional level in Slovenia. Actions to support bioeconomy deployment take place at national level. Relevant strategic documents are the 'Roadmap towards the Circular Economy in Slovenia' (2018) or the 'National Industrial Strategy for 2021-2030'. Besides, Slovenia participates in the BIOEAST initiative.

5.2 Countries with moderate regional strategic action to deploy bioeconomy

There are 15 EU Member States with strategic frameworks at regional level. In these countries, between 1 and 15 regions have bioeconomy-relevant strategic frameworks.

5.2.1 Austria

Summary

- National strategy for bioeconomy (2019).
- 8 regions have strategies related to the bioeconomy.
 - 1 region has a regional strategy with a strong focus (published)
 - 7 regions have regional strategies with minimum bioeconomy content.
- 13 strategies have been identified at regional level, all at NUTS 2 level. All strategies are published.
 - 7 are embedded in wider strategic frameworks (3 in economic development strategies, 3 in regional innovation and research strategies, 1 in a sustainable development plan).
 - 6 are sectoral strategies (all on waste).

The national strategy for bioeconomy was implemented in 2019, and also covers the regional level (federal states, equivalent to NUTS 2). At the regional level, there are no fully dedicated bioeconomy strategies. Notably, many thematically related regional websites refer to the national bioeconomy strategy. Nonetheless, bioeconomy is embedded in 3 regional economic development strategies, 4 science and innovation strategies and 6 regional waste management plans.



Regions with regional strategies	
Role of Bioeconomy in the strategy and strategy status [published / under development]	
	Strategy fully dedicated to bioeconomy
	Bioeconomy is one of the key elements
	Strategy with minimum bioeconomy content

Of the 9 Austrian regions at NUTS 2 level, 8 regions have relevant strategies, but no regions with fully dedicated strategies were identified in the desk review. One region has a regional strategy with a strong focus (published), 7 regions have regional strategies with minimum bioeconomy content.

In total, 13 strategies were identified.

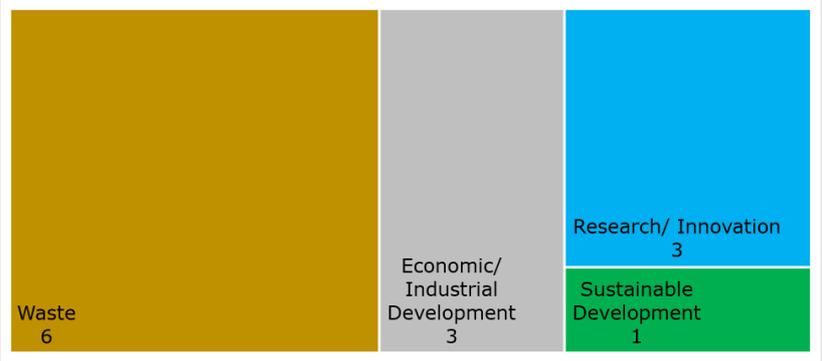
Within most of the documents, references to bioeconomy (implicit or explicit) are often mentioned in a more generic manner, focussing on circular economy. Notably, science and innovation strategies often more specifically target local economies and scientific focus areas rather than bioeconomy measures.

The latest economic strategies, R&I strategies, and Smart Specialisation Strategies (S3) which were updated in 2019/2020 are less specific on 'bioeconomy' themes than older versions published in the years 2014 to 2016. Some of those strategies include approaches for bio-based resources but remain on a rather general level.

From a sectoral perspective, 6 regional waste management plans contain bioeconomy-related provisions. Other sectors (forestry, etc.) are not often covered by 'strategies' but by cluster activities which do not follow a dedicated strategy and are also sometimes

industry initiatives not guided by public authorities. Most identified strategies were embedded in other strategies, mainly in economic/industrial development strategies and research and innovation strategies.

Nevertheless, various bioeconomy-related activities are taking place at regional level, i.e. model regions for bioeconomy are selected and receive financial support for the implementation of their projects. Those activities are however linked to the national bioeconomy strategy, and funding is



also provided at national level. There are both national funding schemes (e.g. from Austria Wirtschaftsservice AWS, Wissenschaftsfonds FWF) but also funding schemes linked to EU programmes (shared management funds). For example, the ERDF and the EAFRD programmes in Austria explicitly target bioeconomy in some of their Interventions/Specific Objectives and provide funding for related projects.

The general approach to bioeconomy at regional level in Austria can be summarised as 'National-level funds, regional level implements' in many cases. Clusters and other regional organisations often advise companies looking for funding for bioeconomy-related projects to look out for various national-level funding sources as the topic is 'anchored' there. However, the Austrian system of governance usually ensures a high level of involvement by the regions (Länder) in many national level actions and strategies. Thus, the need for additional regional-level action in areas where there is no long-standing tradition for it might not be seen by the regions.

Table 6 Austrian regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 2)
Published	Under development	Published	Under development	Published	Under development		
--	--	1 Salzburg	--	7 Steiermark Oberösterreich Niederösterreich Wien Kärnten Vorarlberg Tirol	--	8	9

5.2.2 Belgium

Summary

- All 3 NUTS 1 regions have multiple strategies related to the bioeconomy.
- 15 strategies have been identified at regional level for Belgium, all at NUTS 1 level. All strategies are published.
 - 3 of the 15 strategies are considered fully dedicated bioeconomy strategies (all from Flanders).
 - 10 are embedded in wider strategic frameworks (3 in circular economy strategies, 3 in climate/low-carbon plans, 2 in Smart Specialisation strategies, 1 in a sustainable development plan and 1 in a regional development strategy).
 - 2 are sectoral strategies (one on agriculture/agri-food and one on energy/heating).

Bioeconomy strategic planning in Belgium takes place at regional level, not at national level. The mapping shows that all three NUTS 1 regions in Belgium have bioeconomy-relevant strategic frameworks. Given the diversity of strategies, all three regions are presented in greater detail.

Overall, 15 strategies have been identified for Belgium, all at NUTS 1 level. All strategies are published. Three of these 15 are considered fully dedicated bioeconomy strategies (all from Flanders), 2 are sectoral strategies (one on agriculture/agri-food and one on



energy/heating), while 10 are embedded in wider strategic frameworks (3 in circular economy strategies, 3 in climate/low-carbon plans, 2 in Smart Specialisation strategies, 1 in a sustainable development plan and 1 in a regional development strategy). Of the sectoral/embedded strategies, bioeconomy is only considered a key element in 2, while it plays a smaller role in 10 frameworks.

Flanders

The government of Flanders adopted a regional bioeconomy strategy in 2013, as one of the first regions in Europe. This strategy still provides a basis for policy in the region although additional, more recent, documents have been published in the field of bioeconomy. Other key strategic documents also support the development of the bioeconomy, most notably the circular economy strategy and action plan for food loss and circular residual biomass streams. In addition, the regional development strategy, 'Vision 2050 and the climate change strategy' refer to the bioeconomy as an important focus point for the future.

Flanders' strategies primarily perceive bioeconomy as a horizontal theme that can support other policy objectives. For example, the bioeconomy is a transversal and elementary theme in the transition of Flanders' economy from linear to circular. In addition, documents predominantly focus on enhancing the sector's research and innovation aspects. For example, research and innovation help ensure the quality of biomass for further production



Regions with regional strategies
Role of Bioeconomy in the strategy and strategy status [published / under development]

-  Strategy fully dedicated to bioeconomy
-  Bioeconomy is one of the key elements
-  Strategy with minimum bioeconomy content

on a large scale as well as using and applying techniques to extract elements from biomass for (semi-finished) products. In this sense, the strategic focus is on a large variety of biomass resources and on a large variety of sectors. Sectors most frequently mentioned refer to key clusters defined in Flanders: chemicals and plastics, agri-food, and marine and maritime clusters. Strategic documents are not always explicit regarding actions to enhance Flanders' bioeconomy. However, several funding schemes, collaborative platforms, tax incentives and education programmes are available.

Wallonia

Up to 5 strategies were identified as being related to the bioeconomy. In 1 of these (namely the 'Development plan for biological production in Wallonia'), the bioeconomy is a core issue: agricultural

production is a key sector in the bioeconomy. In the other 4, bioeconomy only plays a minor role: Circular Wallonia (circular economy strategy that deals with bioresource management in a broad sense, including wood, biomass, biowaste); the Walloon Smart Specialisation Strategy (S3) for 2021-2027 (which includes the optimisation of resources as one of the strategic intervention domains); and 2 energy-related strategies that in some way deal with energy generation from biomass and biofuels.

Bioeconomy is itself not targeted by regional authorities but is otherwise addressed through, on one hand, other types of sectoral strategies and, on the other, transversal strategies related to different types of 'transitions'.

Brussels Region

Three initiatives related to bioeconomy could be identified in the Region Brussels Capital. Being a densely populated urban region, Brussels Capital has limited potential for primary production. The recent Smart Specialisation Strategy (S3) identifies the optimisation of resources as one of the main 'Strategic Innovation Domains'. This includes references to actions in the sectors of food and waste management.

Waste management and climate and energy transition are addressed in dedicated strategies. These topics are connected to bioeconomy through biowaste and the optimisation of energy processes for urban needs (food production and provision). These two strategies are also related to older frameworks ('Good Food Strategy in 2015', the Brussels Regional Programme for a Circular Economy in 2016) not included in the database for this study.

Table 7 Belgian regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 1)
Published	Under development	Published	Under development	Published	Under development		
1 Vlaams Gewest	--	1 Region Wallonie	--	1 Region de Bruxelles-Capitale	--	3	3

5.2.3 Czechia

Summary

- First step towards a national strategy on bioeconomy by Ministry of Agriculture (2019).
- 11 regions (NUTS 3) with published strategic frameworks.
 - 2 regions with strategies with strong bioeconomy focus.
 - 9 regions have frameworks with minimum bioeconomy content (published).
- 17 strategic frameworks at local and regional level (NUTS 3 level), 16 of them published, 1 under development.
 - Bioeconomy embedded in wider strategic frameworks in 13 cases, mostly in territorial development plans.
 - Bioeconomy in 4 sectoral strategies, all on energy.

At national level, the Ministry of Agriculture of the Czech Republic made an initial step towards a cross-governmental and sectoral national strategy by adopting the 'Bioeconomy concept in the Czech Republic from the perspective of the Ministry of Agriculture (2019-2024)' in 2019. The Czech Republic also participates in the bioeconomy initiative BIOEAST.



At regional level, there are 11 NUTS 3 regions (out of 14 regions) with published strategic frameworks. There is no fully dedicated bioeconomy strategy. Two regions have documents with a strong bioeconomy focus and 9 regions have frameworks with minimum bioeconomy content.

Research revealed that in one region (Jihočeský kraj), a strategy explicitly dedicated to bioeconomy is under development within the POWER4BIO project. At the time of the research, there were no details available on that strategy, so it has not been included in the database.

For three regions (Plzeňský kraj, Ústecký kraj and Zlínský kraj) no, or no recent, bioeconomy-related strategies could be found.

Overall, 17 strategies were identified for 11 regions: 16 are published, 1 under development.

Only 3 strategies have a strong bioeconomy focus (one of them under development).

Bioeconomy is mainly embedded in territorial development strategies (7),

regional innovation strategies (2 S3 and 2 other innovation strategies) as well as in 2 climate change/low-carbon plans.

Bioeconomy-related topics could be found in 4 sectoral energy strategies.

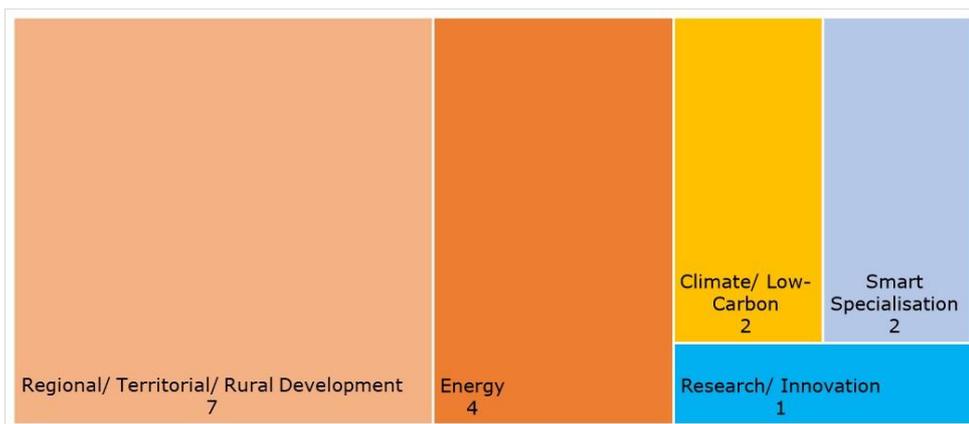


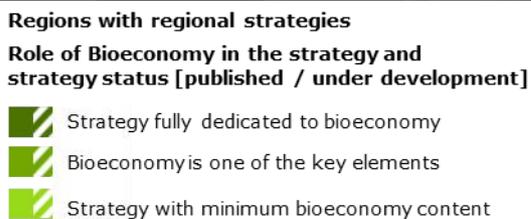
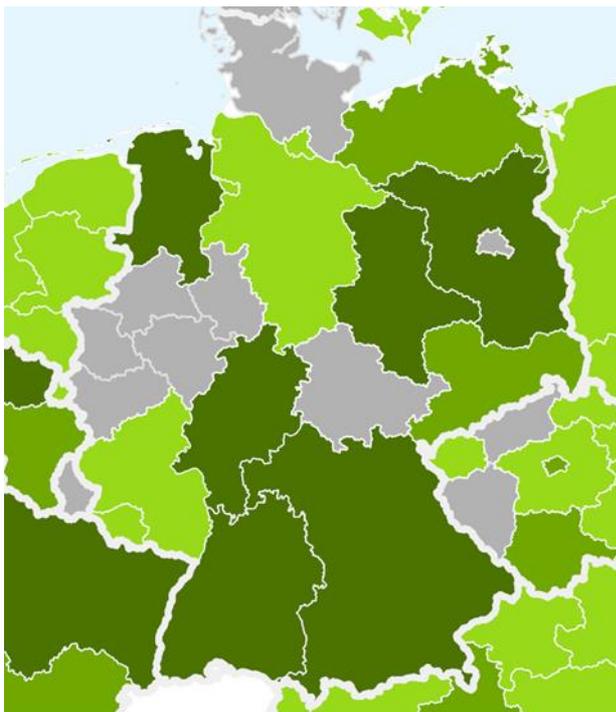
Table 8 Czech regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 3)
Published	Under development	Published	Under development	Published	Under development		
--	--	2 Hlavní město Praha Jihočeský kraj	--	9 Středočeský kraj Karlovarský kraj Liberecký kraj Královéhradecký kraj Pardubický kraj Kraj Vysočina Jihomoravský kraj Olomoucký kraj Moravskoslezský kraj	--	11	14

5.2.4 Germany

Summary

- National strategy for bioeconomy updated in 2020.
- 12 NUTS 1 regions and 1 NUTS 2 region have published strategic frameworks. In addition, there is 1 dedicated strategy covering various NUTS 3 regions.
 - 5 NUTS 2 regions and 1 NUTS 2 region with fully dedicated bioeconomy strategic frameworks.
 - 2 regions have strategies with a strong bioeconomy focus.
 - 5 have frameworks with minimum bioeconomy content.
- 17 strategies at local and regional level (mostly NUTS 1 level), all published.
 - 7 strategies fully dedicated to bioeconomy
 - 10 have the bioeconomy concept embedded in other frameworks (7 in Smart Specialisation Strategies, 2 in sustainable development strategies and 1 in an economic/industrial development strategy).
 - No sectoral strategies.



In Germany, a newly defined 2020 bioeconomy strategy provides the conditions to develop the bioeconomy's full potential for Germany to strengthen its role as a bioeconomy leader and to create the technology and jobs of tomorrow. Two overarching guidelines support the objectives and actions set out in the national bioeconomy strategy.

The situation in German regions is very diverse. In some regions, fully dedicated bioeconomy strategies are in place, including concrete measures and proposals to enhance innovation in this field.

Some regions are more active than others. Twelve NUTS 1 regions out of 16 have regional bioeconomy-relevant strategies. Moreover, 1 region at NUTS 2 level has a relevant strategy.

Most federal regions (also those without a bioeconomy strategy) support individual bioeconomy clusters or networks. These supporting measures offered through the clusters should, however, be considered as soft measures with limited impact.

In the cases of Sachsen and Sachsen-Anhalt, the two federal regions plan to implement a shared bioeconomy strategy

for central Germany. This initiative targets the development of new economic sectors to succeed the coal sector in future following a successful transition. Saxony itself does not

have a fully dedicated bioeconomy strategy, but information in the RIS3 of 2020 and a specialised document from an advisory council.

For Thüringen and Saarland regions no relevant content on bioeconomy could be found in various revised strategies. The Schleswig-Holstein region is leading in blue biotechnology, but there is no up-to-date strategy following the 2012 Masterplan for Marine Biotechnology. Nordrhein-Westfalen’s development of a bioeconomy strategy was decided in 2013. In 2020, a study analysed the regional potentials for bioeconomy, providing recommendations on which sectors to focus on and which assets the Land provides. The Land supports a network active in bioeconomy and biotech but has not yet developed a bioeconomy strategy.

In total, for Germany, 17 regional strategic frameworks featuring bioeconomy could be identified. Seven of them are fully dedicated strategies. Ten have bioeconomy topics embedded in other frameworks (7 in Smart Specialisation Strategies, 2 in sustainable development strategies and 1 in an economic/industrial development strategy).

Of these ten, only 2 have included bioeconomy as a key element, while it plays only a minor role in those remaining.

At NUTS 2 level, which is below the usual regional level (Länder) in Germany, the Weser-Ems region is a leader in bioeconomy, especially related to agriculture, due to the early adoption of the concept and an its own strategy in 2015. Since then, institutions have remained active and continued their work, e.g. the Bioeconomy Strategy Council Weser-Ems²⁴. The strategy, however, has not been updated since then.

Another local strategy has been identified covering the metropolitan region of Frankfurt.



Table 9 German regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country*
Published	Under development	Published	Under development	Published	Under development		
6 Baden-Württemberg Bayern Hessen Sachsen-Anhalt Brandenburg Weser-Ems	--	2 Sachsen Mecklenburg-Vorpommern	--	5 Rheinland-Pfalz Saarland Bremen Hamburg Niedersachsen	--	12 NUTS 1 and 1 NUTS 2	16 NUTS 1 and 38 NUTS 2

*The mapping for Germany was carried out at NUTS 1 level. However, one of the identified regions with a bioeconomy strategy has a different NUTS level (NUTS 2), so the full breakdown is presented. Thus, the relative share of regions with bioeconomy strategies at NUTS 2 level should be considered with caution as it may not be representative.

NOTE: One of the German strategies could not be aligned with one NUTS region. It was not included in this table (Metropolregion Frankfurt) as it covers various regions in the country.

²⁴ For more info, please see: <https://www.weser-ems.eu/wissensregion/de/biooekonomie/>

5.2.5 Denmark

Summary

- National strategy for circular economy with one initiative on bioeconomy (2018).
- 4 NUTS 2 regions with published strategies.
 - 1 region with a fully dedicated bioeconomy strategy.
 - 1 region with a strategy with a strong bioeconomy focus.
 - 2 have frameworks with minimum bioeconomy content.
- 7 strategies at local and regional level.
 - Bioeconomy embedded in wider strategic frameworks in 3 cases, two on green transition and one on sustainable development.
 - Bioeconomy in 3 sectoral strategies, all on energy and bioenergy.



The Danish government has appointed a National Bioeconomy Panel, whose mission statement was last updated in August 2019: 'The National Bioeconomy Panel will provide advice on where and how best to accelerate the further development of new, sustainable value chains within the bioeconomy in Denmark, for the benefit of the economy, employment, the environment and the climate.' The Panel published its recommendations in December 2019, in a report entitled 'Sustainable building blocks for the Future'. This report recommends the adoption of a national strategy that would 'define clear political objectives and set the basis for investments': 'The national strategy should focus on the provision of sustainable biomass from both optimised use of biological residues and side streams and from biomass production, provide direction for sustainable use of bioresources, including the framework conditions for

biorefining in Denmark and encourage demand for sustainable bio-based products and services rather than fossil based alternatives.' Denmark participates in the macroregional bioeconomy initiative 'Nordic Bioeconomy' being developed by the Nordic countries.

Furthermore, the Danish government had adopted a national 'Strategy for Circular Economy' in 2018. This strategy was associated with an action plan with a budget of EUR 15.6 million for 15 initiatives. Initiative 15 is entitled 'get more value out of biomass', which includes the setting up of a 'think tank on prevention of Food Loss and Food Waste'. This think tank has been established under the name 'ONE\THIRD'.

At regional level, of the 5 NUTS 2 regions in Denmark, 4 have a bioeconomy-relevant strategy.

Overall, 7 strategies at regional/local level have been identified for Denmark: 5 of them at regional (NUTS 2) level, 2 at local level.

One of 7 strategies is still under development, 6 are published.

One strategy is a fully dedicated bioeconomy strategy; 3 are sectoral strategies focusing on the energy sector (green, biogas, biofuels), in which the bioeconomy plays a small role; while 3 are embedded in wider strategies (1 in a sustainable development strategy, 2 in green growth/transition plans).



Of the 6 sectoral or embedded frameworks, the bioeconomy plays a key role in only one strategy.

Table 10 Danish regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 2)
Published	Under development	Published	Under development	Published	Under development		
1 Midtjylland	--	1 Nordjylland	--	2 Hovedstaden Sjælland	--	4	5

5.2.6 Greece

Summary

- National plan for energy and climate refers to bioeconomy.
- 2 regions (NUTS 2 level) with published strategies.
 - 1 region with a strategy where bioeconomy is a key element.
 - In the other region bioeconomy plays a minor role in the strategy.
- 3 published strategies have been identified at the regional level.
 - Bioeconomy embedded in wider strategic frameworks in all 3 cases, 2 of them embedded in circular economy action plans, while in 1 bioeconomy embedded in a Smart Specialisation Strategy.
 - No sectoral strategies were identified.



Regions with regional strategies

Role of Bioeconomy in the strategy and strategy status [published / under development]

-  Strategy fully dedicated to bioeconomy
-  Bioeconomy is one of the key elements
-  Strategy with minimum bioeconomy content

Greece does not have a dedicated national bioeconomy strategy, nor are there regional bioeconomy strategies in place. Nevertheless, bioeconomy seems to be a priority and is embedded in one way or another in a number of national and regional documents.

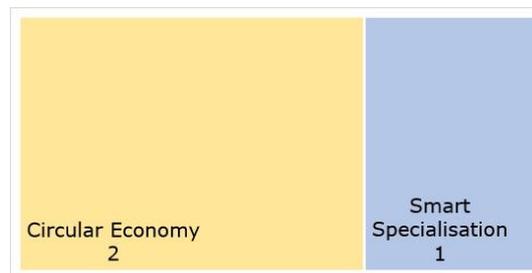
The national long-term strategy for 2050 for Greece positions bioeconomy as one of the key axes for climate neutrality by 2050. The same document highlights the importance of bioeconomy which may have a multiplier effect for the economy and employment, especially when it comes to the production and industrial conversion of biomass into energy products. The link to bioeconomy here is made through biogas production and use in reducing the carbon footprint. Greece also has a national circular economy strategy (2018), accompanied by the 'Greek National Action Plan on Circular Economy' (2021). The national plan for energy and climate also refers to bioeconomy. Together with circular economy these shall be the catalysts for the productive reconstruction

of the country with climate mitigation objectives, more sustainable use of resources, and lower CO₂ emissions. Bioeconomy is also referred to in relation to the replacement of fossil fuels, through recyclable products, bio-based and compostable biodegradable products. Bioeconomy is also indirectly related to the 'National Waste Management Plan' (2020), and the regional waste management plans. Old, relevant national policies consider the 'National Strategy for the Adaptation to Climate Change' (2016) and the 'National Biodiversity Strategy' (2014).

At regional level, a number of regions mention circular economy as an important element - e.g. Attica, Epirus, Thessaly - but with no specific plan or strategy at present. In most cases, circularity is related to improved waste management approaches. Interreg programmes have played a part in embedding bioeconomy in regional action plans. One example is the region of Central Macedonia, which developed an 'Action Plan for the

promotion of circular economy in SME of the Central Macedonia prefecture' and a 'Regional action plan for the promotion of circular bioeconomy' through the Interreg Europe projects, CESME and BIOREGIO, respectively.

Of the 13 NUTS 2 regions in Greece, 2 regions have a strategic bioeconomy-relevant strategy. These regions are Central Macedonia and Crete. Central Macedonia has two strategic documents to promote the circular economy, one focusing on the 'circular bioeconomy'. The region of Crete has updated its S3 for 2021-2027 with minimum bioeconomy content.



All 3 strategies are published. Only 1 has bioeconomy as a key element, while in the other 2 bioeconomy plays a minor role.

There is also some support to strategic action at local level. Some local initiatives, linked in a broader context to bioeconomy are presented below.

The Hellenic Agency for Local Development and Local Government has also published a manual for local authorities on how they can make use of circular economy and proposes fields for action (e.g. on waste management, energy, sustainable mobility etc.). However, no strategy related to bioeconomy could be identified.

The city of Thessaloniki has developed a resilience strategy named 'Resilient Thessaloniki': a strategy for 2030, where circular economy principles are presented as future actions, e.g. when it comes to local waste management action plans and recycling. However, bioeconomy plays only a marginal role in it, so this strategy was not included in the database for the study.

Table 11 Greek regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 2)
Published	Under development	Published	Under development	Published	Under development		
--	--	1 Central Macedonia	--	1 Crete	--	2	13

5.2.7 Croatia

Summary

- National strategy under development
- One published strategy for one NUTS 3 region (Splitsko-dalmatinska županija) was identified.
 - The strategy has minimum bioeconomy content.
 - Bioeconomy is embedded in a circular economy action plan.



Regions with regional strategies	
Role of Bioeconomy in the strategy and strategy status [published / under development]	
	Strategy fully dedicated to bioeconomy
	Bioeconomy is one of the key elements
	Strategy with minimum bioeconomy content

Croatia does not have yet a national or any regional bioeconomy or bioeconomy-relevant strategy. However, the national government under the BIOEAST Initiative is in the process of developing a dedicated bioeconomy strategy at national level. Relevant bioeconomy topics are mentioned in *Strategic transformation in Agriculture and Rural Space*. Woody biomass and biomass from agriculture are also mentioned in the draft 'Integrated Energy and Climate Plan 2021 – 2030'.

At the same time, circular economy is mentioned as a priority in the national development strategy for 2030 but with no further details on specific bioeconomy topics.

Circular bioeconomies feature as an intervention in *Beyond the Pond - A vision and Roadmap for the Strategic Transformation of the Aquaculture Sector - Croatia 2020-2030*.

At regional level, only one strategy was identified, where bioeconomy is embedded into a circular economy action plan. Thus,

only 1 of the 21 NUTS 3 regions in Croatia has a relevant strategy in place, namely the Splitsko-dalmatinska županija.

The strategy has minimum bioeconomy content. The Action Plan was developed within the framework of the CIRCE2020 project from Interreg Central Europe.

Table 12 Croatian regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 3)
Published	Under development	Published	Under development	Published	Under development		
--	--	--	--	1 Split Dalmatia County	--	1	21

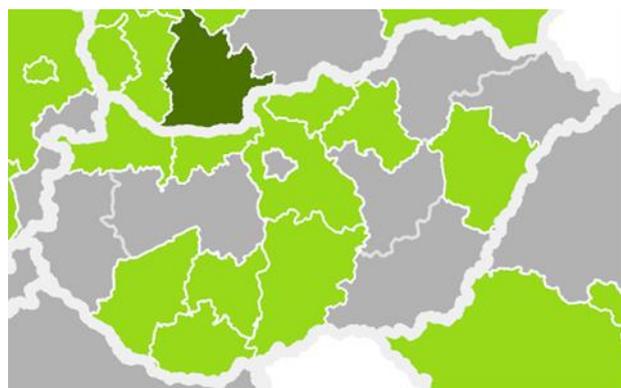
5.2.8 Hungary

Summary

- National strategy under development.
- 10 NUTS 3 regions have published strategies related to the bioeconomy.
 - In all 10 regions, bioeconomy plays a minor role in the strategy.
- 10 strategies have been identified at regional level, all at NUTS 3 level. All strategies are published.
 - All strategies are embedded in territorial development programmes.

In Hungary, the national strategy dedicated to bioeconomy is under development²⁵. So far, Hungary does not have a dedicated bioeconomy strategy or action plan. Nevertheless, conceptual elements related to the bioeconomy appear in other national strategies and in the territorial strategies and programmes with varying emphasis. In addition, Hungary participates in the bioeconomy initiative BIOEAST.

Many strategies and programmes at national level that mention bioeconomy rely on the use of EU funds, primarily the ERDF. For the 2021-2027 funding period, most development programmes mention bioeconomy connected to the circular economy approach. Documents also mention the mitigation and adoption of climate change efforts.



Regions with regional strategies
Role of Bioeconomy in the strategy and strategy status [published / under development]

-  Strategy fully dedicated to bioeconomy
-  Bioeconomy is one of the key elements
-  Strategy with minimum bioeconomy content

At regional level, the mapping identified 10 regional strategies. Out of 20 NUTS 3 regions in Hungary, 10 regions have included bioeconomy to some extent in their territorial development strategies. All strategies are published.

Bioeconomy plays a very small role in these in addition to other topics and priorities. The developed strategies mostly deal with the use of agricultural biomass and municipal waste.

With regard to the ERDF Operational Programmes, elements of the bioeconomy are discussed along with the same 'classical' keywords: e.g. climate change, renewables, safety in food production, circular economy (farming), etc. More specified terminology – and actions and activities – are rare in the documents.

At regional level, there are no fully dedicated bioeconomy strategies or other strategies where bioeconomy plays a major role.

²⁵ Knowledge Centre for Bioeconomy (2022) - Bioeconomy country dashboard, https://knowledge4policy.ec.europa.eu/bioeconomy/country/hungary_en (10.1.2022).

Table 13 Hungarian regions and their bioeconomy strategies

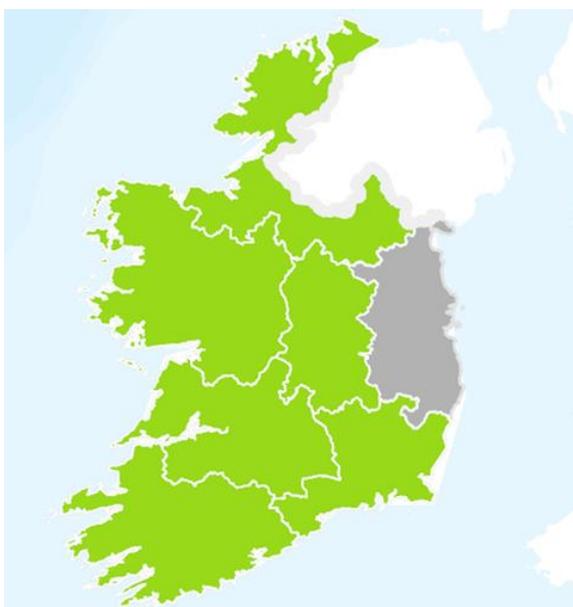
Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 3)
Published	Under development	Published	Under development	Published	Under development		
--	--	--	--	10 Hajdú-Bihar Tolna Győr-Moson-Sopron Somogy Pest Nógrád Heves Baranya Komárom-Esztergom Bács-Kiskun	--	10	20

5.2.9 Ireland

Summary

- National Policy Statement on the Bioeconomy.
- 7 regions (6 at NUTS 3 level and 1 at NUTS 2 level) have strategies related to the Bioeconomy.
 - All 7 regions have frameworks with minimum bioeconomy content.
- 10 strategies have been identified at regional level. All strategies are published.
 - 3 are embedded in wider strategic frameworks on economic/business development.
 - 7 are sectoral strategies (6 in the field of forestry and 1 on agriculture/agri-food).

Ireland operates using a national bioeconomy strategy (the 'National Policy Statement on the Bioeconomy') as well as overarching strategies (Project Ireland 2040 – National Planning Framework and the associated National Development Plan 2018-2027), which cover bioeconomy elements. Dedicated sectoral strategies are also only consistently available at national level (such as the National Strategic Plan for Sustainable Aquaculture Development or the strategy Bioenergy Supply in Ireland 2015-2035). Key actors are – correspondingly – at national level: the Department of Communications, Climate Action and Environment (DCCA); the Department of Agriculture, Food, and the Marine (DAFM); the Department of Jobs, Enterprise, and Innovation (DJEI); and the Department of the Taoiseach (the Prime Minister's office).



Regions with regional strategies	
Role of Bioeconomy in the strategy and strategy status [published / under development]	
	Strategy fully dedicated to bioeconomy
	Bioeconomy is one of the key elements
	Strategy with minimum bioeconomy content

This pronounced emphasis on national legislation and strategies has been complemented by several regional efforts. There are only a few strategies at regional level, most of which are only tangentially related to bioeconomy. These include the Regional Enterprise Plans which are coordinated by the DJEI at national level. They sometimes foresee funding for bioeconomy, primarily via grants in the field of research, as well as in the financing of competence centres.

Coillte Ireland (the publicly owned company managing Ireland's forest areas) has regional forestry plans which outline their biomass strategies. However, there are no dedicated strategies in the sense that they foresee the distribution of funding, etc.

Most regional strategies use their own distinct regional classification, which differs from NUTS. With slight changes compared to the NUTS classification, it can be concluded that of the 8 Irish NUTS 3 regions, 6 have strategic frameworks related to the bioeconomy. In addition, 1 NUTS 2 region also included bioeconomy in a relevant framework.

At regional level, there are no fully dedicated bioeconomy strategies; all strategic frameworks include bioeconomy as only one small element among others, without specifying actions and measures.



Overall, 10 regional strategies were identified. Of those, 7 are sectoral strategies (6 in the field of forestry plans and 1 on agriculture/agri-food).

Three strategies have the bioeconomy topic embedded in an economic/business development strategy.

Table 14 Irish regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 3)
Published	Under development	Published	Under development	Published	Under development		
--	--	--	--	7 Mid-West South-East South-West North-West North-East Midland Central Munster	--	7	8

5.2.10 Lithuania

Summary

Currently developing bioeconomy strategy at national level

- 1 local area has a Smart Specialisation Strategy where bioeconomy is an important element.



Regions with regional strategies
Role of Bioeconomy in the strategy and strategy status [published / under development]

- Strategy fully dedicated to bioeconomy
- Bioeconomy is one of the key elements
- Strategy with minimum bioeconomy content

Lithuania is currently developing a dedicated bioeconomy strategy at national level. Bioeconomy is, in the meantime, mostly included in other national strategic frameworks. For example, it is mentioned in the Lithuania 2030 progress strategy and in the National Energy and Climate Action Plan of the Republic of Lithuania for 2021-2030. Bioeconomy is also addressed in the national Smart Specialisation Strategy in Lithuania, which includes six broad fields, one being 'Agro-innovation and food technologies'. Priority areas within this field cover the sustainable use of biomaterials, functional food and innovative development, the improvement and processing of biological raw material (biorefinery). Lithuania also participates in the bioeconomy initiatives Bioeconomy in the Baltic Sea Region and BIOEAST.

At NUTS 3 regional level (10 regions), no strategic framework with bioeconomy content could be identified. At local level, one strategy was identified. An association of local authorities in the Klaipėdos apskritis region has defined a Smart Specialisation Strategy as a basis for regional development in the next years. Bioeconomy is embedded within it as one important element.

For the future, the mapping results indicate that a relevant regional strategy is under development in the Panevėžjo apskritis region; however, to date there is no further information on this, so it has not been taken into account for the database.

Table 15 Lithuanian regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 3)
Published	Under development	Published	Under development	Published	Under development		
--	--	1 Klaipėdos apskritis	--	--	--	1	10

5.2.11 Latvia

Summary

- A national bioeconomy strategy exists.
- 2 NUTS 3 regions have strategies related to the bioeconomy.
 - 1 region has a fully dedicated bioeconomy strategy.
 - 1 region has a strategy with a strong bioeconomy focus.
- 2 strategies have been identified at regional level. Both strategies are published.
 - 1 is a dedicated bioeconomy strategy.
 - 1 is embedded in a sustainable development strategy.
 - There are no sectoral strategies.



Regions with regional strategies	
Role of Bioeconomy in the strategy and strategy status [published / under development]	
	Strategy fully dedicated to bioeconomy
	Bioeconomy is one of the key elements
	Strategy with minimum bioeconomy content

There is a national bioeconomy strategy in Latvia. The national Bioeconomy Strategy 2030 was approved by the Government of Latvia in 2017. The Ministry of Agriculture together with the Latvia University of Life Sciences and Technologies were responsible for its development. One of the five actions in the national Bioeconomy Strategy 2030 suggests a 'Result-oriented motivation system for local governments' (5.2.3.) to encourage business development in the field of bioeconomy by creating new support measures to be used by the local governments based on their needs and possibilities. Bioeconomy is also one of the priorities of the national Strategy for Smart Specialisation (S3), i.e. 'knowledge-intensive bioeconomy'. In addition, Latvia participates in the BIOEAST initiative and in the macroregional project to promote bioeconomy in the Baltic Sea Region.

According to the information collected during the web survey, a revision and update of the national bioeconomy strategy can be expected soon.

There is a close link between bioeconomy and the National Action Plan for Transition Towards Circular Economy 2020-2027 adopted in September 2020. The strategy acknowledges the relevant bioeconomy development potentials of regions and rural territories and suggests that 'bioeconomy will facilitate the development of rural territories and regions of Latvia'.

At regional level, 2 strategies could be identified. Two of the 6 Latvian NUTS 3 regions have strategic frameworks related to bioeconomy. These are the Vidzeme Planning Region (LV008) and the Zemgale Planning Region (LV009).

Fully dedicated 1	Sustainable Development 1
----------------------	------------------------------

One strategy is a fully dedicated bioeconomy strategy focusing on the creation of a bioeconomy innovation system.

The other framework covers bioeconomy as an embedded topic within a sustainable development strategy, bioeconomy being one of the key elements.

Table 16 *Latvian regions and their bioeconomy strategies*

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 3)
Published	Under development	Published	Under development	Published	Under development		
1 Vidzeme	--	1 Zemgale	--	--	--	2	6

5.2.12 The Netherlands

Summary

- A national strategy for bioeconomy exists.
- 4 NUTS 1 regions and 1 NUTS 2 region have strategies related to the bioeconomy.
 - 1 regional strategy has a strong focus on bioeconomy.
 - 4 regional strategies with minimum bioeconomy content.
- 6 strategies have been identified at regional level. All strategies are published.
 - 1 fully dedicated bioeconomy strategy covers various regions in the country.
 - 5 are embedded in wider strategic frameworks, mostly in Smart Specialisation Strategies.
 - No sectoral strategies could be identified.

Strategic policy documents for the bioeconomy are predominantly published at national level in the Netherlands. This includes among others, a dedicated bioeconomy strategy as well as a strategic vision on the use of biomass. In addition, other national strategic policy documents, such as the national circular economy strategy, refer to elements of the bioeconomy.



Regions with regional strategies	
Role of Bioeconomy in the strategy and strategy status [published / under development]	
	Strategy fully dedicated to bioeconomy
	Bioeconomy is one of the key elements
	Strategy with minimum bioeconomy content

National-level objectives and ambitions are translated into regional-level policies but not always with the publication of additional strategic policy documents (strategies, roadmaps, action plans etc.). All regional authorities (provinces) refer to bioeconomy on their webpages in one way or another, mostly in relation to their economic policy, circular economy, support to agri-food and chemical sectors as well as to energy transition. The webpages for the provinces refer to specific implementation programmes, fact sheets or studies providing more information on the bioeconomy in their province (as part of other policies) without giving many details on specific objectives for the bioeconomy, sectors, biomass resources or instruments.

Overall, 6 regional strategic frameworks have been identified. One strategy is a fully dedicated bioeconomy plan covering various regions in the south of the country (Zuid-Holland), which has not been assigned to one NUTS region in the analysis.

Five are regional strategies. They relate to the 4 NUTS 1 regions in the Netherlands and to 1 NUTS 2 region.

All 5 strategies have the bioeconomy embedded in other frameworks (4 in Smart Specialisation Strategies and 1 in an economic development/industrial strategy).



Only 1 of these 5 strategies features bioeconomy as a key element, while 4 have minimum bioeconomy content.

All four 2021-27 Smart Specialisation Strategies in the Netherlands mention elements of the bioeconomy, although the relevance of the topic differs by strategy. Bioeconomy is most pronounced in the strategies for East, South and North

Netherlands and less explicitly referred to in the strategy for West Netherlands. However, in general, bioeconomy in the S3 documents is only one priority among several others.

Table 17 Dutch regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country*
Published	Under development	Published	Under development	Published	Under development		
--	--	1 Zeeland	--	4 Noord NL Oost-NL West NL Zuid-NL	--	4 NUTS 1 and 1 NUTS 2	4 NUTS 1 and 12 NUTS 2

*The mapping for the Netherlands was carried out at NUTS 1 level. However, one of the identified regions with a bioeconomy strategy has a different NUTS level (NUTS 2), so the full breakdown is presented. Thus, the relative share of regions with bioeconomy strategies at NUTS 2 level should be considered with caution as it may not be representative.

NOTE: One of the Dutch strategies could not be aligned with one region. It was not included in this table (Zuid-Holland) as it covers various regions in the country.

5.2.13 Portugal

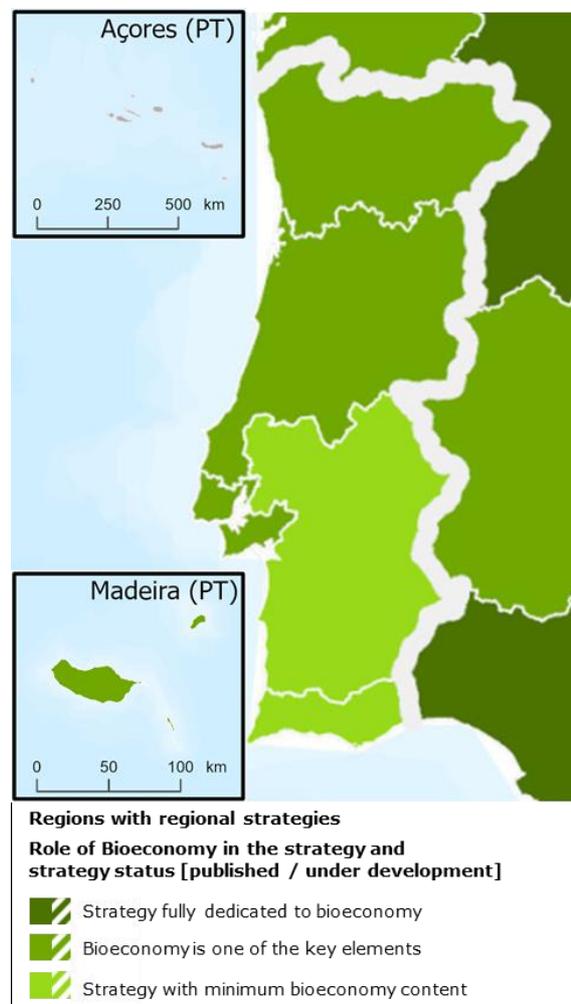
Summary

- A national Strategy for a Sustainable Bioeconomy 2025 exists (published in 2021).
- 7 regions (6 NUTS 2 regions and 1 NUTS 3) with published strategic frameworks.
 - 4 regions have a regional strategy with a strong focus.
 - 3 regions have regional strategies with minimum bioeconomy content.
- 12 strategies at regional and local level could be identified. All strategies are published.
 - 1 strategy covers parts of various NUTS 3 regions in the Pinhal Interior region.
 - 11 strategies where bioeconomy is embedded in wider strategic frameworks, predominantly in circular economy strategies, in Smart Specialisation Strategies and territorial development plans.
 - 1 sectoral strategy on waste.

Portugal has a centralised approach with various significant strategies at national level related to the deployment of bioeconomy. For example, the national 'Action Plan for a Strategy for a sustainable bioeconomy 2025' was published in December 2021²⁶. Bioeconomy is also integrated into the national Research and Innovation Agenda. A regional dimension can be found in relation to the 2018 National Action Plan for Circular Economy (PAEC as Portuguese acronym), which is broken down into several actions. This Action Plan foresees the breakdown into Regional Agendas for the Circular Economy, developed by the Regional Commissions for Coordination and Regional Development.

Within this context, 7 regions (6 at NUTS 2 and 1 at NUTS 3 level) have a bioeconomy-relevant strategy, i.e. almost all NUTS 2 regions in Portugal. No document could be found for Região Autónoma dos Açores.

Regional Agenda documents (published between 2019 and 2021) could be found for the regions Norte, Centro, Algarve and Área Metropolitana de Lisboa. No Regional Agenda document seems to exist in the Alentejo region, even if a set of measures exists related to other, older documents and a regional project with several measures called 'Alentejo Circular'. The topic of bioeconomy, however, is integrated into the Regional Development Plan and the Alentejo Smart Specialisation Strategy.



²⁶ <https://apambiente.pt/apa/bioeconomia>

In the same context, there is a regional strategy for circular development in the Região Autónoma da Madeira with a strong link to the bioeconomy. In addition, the new Madeira Waste Strategy supports the study and implementation of a biodegradable waste management system.

Overall, 12 regional strategies related to bioeconomy have been identified for Portugal. In 7 of these strategies, bioeconomy is embedded in the circular economy approach, mostly referring to the use and exploitation of natural resources, but also to the use of sustainable and biological materials in industry and packaging and the re-use of different types of waste.

Bioeconomy also plays an important role in some of the new Smart Specialisation Strategies 2021-2027 (in 2 documents for the Centro and Alentejo regions), as well as in territorial/regional development plans (2 documents, for the Alentejo and Pinhal Interior regions). One strategy is sectoral and refers to the waste sector.



In 7 documents, bioeconomy is one of the main elements, while in 5 it plays only a minor role.

In general, it can be expected that bioeconomy will have a prominent role in most regional Smart Specialisation Strategies and Regional Development Plans, now linked to the new funding period 2021-2027. However, at the time of this study not all documents were available.

Two documents with bioeconomy content were found at NUTS 3 level. One is a local strategy at NUTS 3 level for the metropolitan area of Porto ('Roadmap for Circular Porto by 2030'), where bioeconomy plays a minor role in a circular economy strategy. In addition, there is the circular bioeconomy strategy for the Pinhal Interior Region, which covers parts of two NUTS 3 regions in the Portuguese hinterland. Here, the bioeconomy is part of a wider regional recovery plan for this disadvantaged rural region. This last strategy could not be assigned to any specific NUTS regions. Therefore, it is not included in the maps and in the overview table.

Table 18 Portuguese regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country*
Published	Under development	Published	Under development	Published	Under development		
--	--	4 Norte Centro Área Metropolitana de Lisboa R.A. da Madeira	--	3 Algarve Alentejo Área Metropolitana do Porto	--	6 NUTS2 and 1 NUTS3	7 NUTS2 and 25 NUTS3

*The mapping for Portugal was carried out at NUTS 2 level. However, one of the identified regions with a bioeconomy strategy has a different NUTS level (NUTS 3), so the full breakdown is presented. Thus, the relative share of regions with bioeconomy strategies at NUTS 3 level should be considered with caution as it may not be representative.

NOTE: One of the Portuguese strategies could not be aligned with one NUTS region. It was not included in this table (Strategy for Pinhal Interior) as it covers parts of various NUTS 3 regions in the country.

5.2.14 Romania

Summary

- The national Research, Development and Innovation 2014-2020 Strategy includes bioeconomy as one of its focus areas.
- 7 regions (NUTS 2) have published strategies related to the bioeconomy.
 - 1 region with a fully dedicated bioeconomy strategy.
 - 2 regions have a strategy with a strong bioeconomy focus.
 - 4 regions have strategies with minimum bioeconomy content.
- 8 strategies have been identified at regional level.
 - 1 is fully dedicated to bioeconomy.
 - 7 are embedded in wider strategic frameworks, 5 in Smart Specialisation Strategies (S3) and 2 in Regional Development Plans.
 - No sectoral strategies were found.



Regions with regional strategies Role of Bioeconomy in the strategy and strategy status [published / under development]

- Strategy fully dedicated to bioeconomy
- Bioeconomy is one of the key elements
- Strategy with minimum bioeconomy content

In Romania, there is no dedicated national bioeconomy strategy, but a national for Research, Development and Innovation Strategy 2014-2020, which sets bioeconomy as one Smart Specialisation focus in terms of agriculture, aquaculture and fish-farming as well as forestry²⁷. In addition, Romania participates in the BIOEAST bioeconomy initiative.

The mapping identified a limited number of bioeconomy strategies at regional level. Only one region (Sud-Muntenia) has a dedicated bioeconomy-relevant strategy – an action plan on bioeconomy-based circular economy, which was conceived as part of an Interreg project. Most regions already have or are in the process of publishing, their regional strategy for the 2021-2027 period. While these documents are often very extensive, general topics

related to bioeconomy are missing. Most regions have also finalised preparations for their Smart Specialisation Strategies. Some of these documents mention the bioeconomy and introduce specific measures in more detail.

In general, of the 8 NUTS 2 regions in Romania, there are 7 regions with bioeconomy-relevant strategies: 1 region has a fully dedicated bioeconomy strategy, 2 regions have a strategy with a strong bioeconomy focus, 4 regions have strategies with minimum bioeconomy content.

The Vest is the only region with two strategic documents related to bioeconomy, one Regional Development Plan and a Smart Specialisation Strategy.

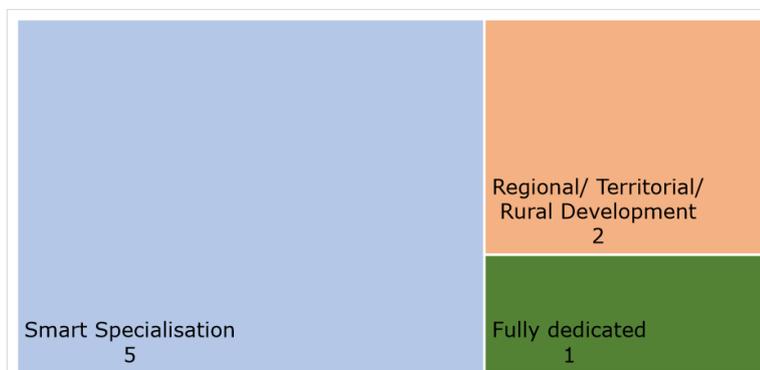
²⁷ Knowledge Centre for Bioeconomy (2022) Bioeconomy country dashboard, https://knowledge4policy.ec.europa.eu/bioeconomy/country/romania_en (10.1.2022).

Lower administrative levels were not analysed, even if further strategies might exist at local level²⁸.

Overall, 8 regional strategies at NUTS 2 scale were identified, all of them published.

Of those, 1 is the fully dedicated bioeconomy strategy already mentioned. 7 strategies cover the bioeconomy as embedded in a wider strategic framework, 5 in Smart Specialisation Strategies (S3) and 2 in Regional Development Plans.

The most relevant sectors related to the bioeconomy strategic frameworks are waste, agriculture, agri-food, forestry and fisheries. The biomass resources addressed are generally waste and agricultural residues.



Bioeconomy-related clusters were identified in multiple regions, also possibly indicating the existence of strategic frameworks, but information on their objectives, actions, activity as well as possible contact points is mostly missing.

Table 19 Romanian regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 2)
Published	Under development	Published	Under development	Published	Under development		
1 Sud-Muntenia	--	2 Sud-Est Nord-Est	--	4 Vest Sud-Vest Oltenia București- Ilfov Centru	--	7	8

²⁸Recently, the Covasna region (NUTS 3, RO123) published a bioeconomy roadmap https://be-rural.eu/wp-content/uploads/2022/01/EN_OIP-Covasna-BioRoadmap_with-Annex.pdf within the framework of the BE-Rural project. This strategy is not included in the database as the geographical scope of the research for Romania was at NUTS 1-NUTS 2 level.

5.2.15 Slovakia

Summary

- No national strategy currently in place, but an action plan for a bioeconomy strategy is being prepared under the BIOEAST Initiative.
- 5 regions have strategies related to the bioeconomy.
 - 1 region has a fully dedicated bioeconomy strategy.
 - 4 regions have strategies with minimum bioeconomy content.
- 5 strategies have been identified at regional level. All strategies are published.
 - 1 is a Bioeconomy Cluster Development Strategy.
 - 4 are embedded in wider strategic frameworks (1 in a climate/low-carbon plan, 1 in an economic development strategy, 1 in a territorial development strategy and 1 in an education strategy).
 - No sectoral strategies.

At national level, no bioeconomy strategy exists thus far. Currently, the Ministry of Agriculture is preparing an action plan for the preparation of a bioeconomy strategy under the BIOEAST Initiative.

Out of 8 Slovakian regions at NUTS 3 level, there are 5 regions with bioeconomy strategies: 1 region has a dedicated bioeconomy strategy, 4 regions have strategies with minimum bioeconomy content.



Regions with regional strategies	
Role of Bioeconomy in the strategy and strategy status [published / under development]	
	Strategy fully dedicated to bioeconomy
	Bioeconomy is one of the key elements
	Strategy with minimum bioeconomy content

In one Slovakian region (Nitriansky kraj), a Bioeconomy Cluster (BEC) was established to develop the bioeconomy. That cluster published the 'Bioeconomy Cluster Development Strategy to 2025'.

Four regions (Bratislavský kraj, Trnavský kraj, Trenčiansky kraj and Košický kraj) have a strategy or programme where bioeconomy plays a minor role, for example, in an economic and social development programme, a low carbon strategy, an environmental education concept, and a territorial development strategy.

The Slovak university of Agriculture in Nitra, in cooperation with the regional

authority of the Nitriansky kraj, has prepared support for the development of a bioeconomy strategy within the H2020 project POWER4Bio, but the region is not currently taking further steps to prepare the strategy itself. Some regions are trying to take steps to prepare a bioeconomy strategy (Nitriansky kraj), a green strategy (Košický kraj) or a climate strategy (Trnavský kraj).

No bioeconomy-related strategies could be found for three regions (Žilinský kraj, Banskobystrický kraj and Prešovský kraj).

Fully dedicated 1	Climate/ Low-Carbon 1	Other 1
Regional/ Territorial/ Rural Development 1	Economic/ Industrial Development 1	

Overall, 5 regional strategies were identified. Of those, 1 is a fully dedicated bioeconomy strategy. There are 4 strategies where bioeconomy is embedded in 4 different strategic frameworks, namely in a climate/low-carbon plan, an economic development strategy, a territorial development strategy and an environmental education strategy.

Table 20 Slovakian regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 3)
Published	Under development	Published	Under development	Published	Under development		
1 Nitriansky kraj	--	--	--	4 Bratislavský kraj Trnavský kraj Trenčiansky kraj Košícký kraj	--	5	8

5.3 Countries with intense regional strategic action to deploy the bioeconomy

There are six larger countries with intense regional strategic action to deploy the bioeconomy. In each of these countries more than 15 regions have bioeconomy-relevant strategies and in many cases, there are several strategies per region. These countries are Spain, Finland, France, Italy, Poland and Sweden.

5.3.1 Spain

Summary

- A national bioeconomy strategy is in place (2015, expected to be updated in 2022).
- 17 regions with strategic frameworks (16 at NUTS 2, 1 at NUTS 3 level), of which 14 are published and 3 under development.
 - 3 regions with a fully dedicated bioeconomy strategic framework.
 - 7 regions have documents with a strong bioeconomy focus (1 of them under development)
 - 7 regions with frameworks with minimum bioeconomy content (2 of them under development).
- 42 strategies have been identified at local and regional level (mostly at NUTS 2 level), 36 of those published, 6 under development.
 - 3 fully dedicated bioeconomy strategies.
 - In 23 cases, bioeconomy is embedded in wider strategic frameworks, mostly in circular economy strategies, Smart Specialisation Strategies (S3) or in blue growth strategies.
 - 16 sectoral strategies, mostly on forestry and agriculture/agri-food.

At national level, the main instrument for the development of the bioeconomy is the 'Spanish Bioeconomy Strategy: Horizon 2030', published in 2015. This strategy was developed by the Ministry of Economy and Competitiveness, with the collaboration of the former Ministry of Agriculture, Food and Environment and coordinated by the National Institute for Agricultural and Food Research and Technology (INIA). The strategy is expected to be updated in 2022.

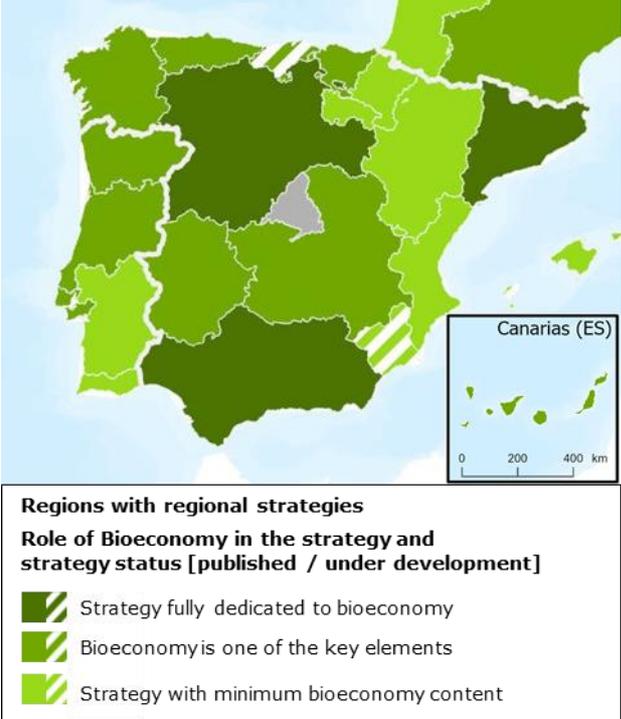
More recently, the concept of bioeconomy was integrated into 'Spain Circular 2030', Spanish national strategy on circular economy. The Spanish circular economy strategy, was approved in June 2020, laying the foundations to promote a new production and consumption model.

At regional level, out of a total of 19 NUTS 2 regions, 16 Spanish regions are working on the deployment of the bioeconomy from different angles²⁹.

Some regions take their regional economic sectors as a starting point (fisheries/aquaculture, forestry or agriculture); some of them include bioeconomy measures in waste management plans or circular economy strategic documents. Other regions include bioeconomy topics in blue/green growth or sustainable development strategies. The bioeconomy tackled from an industrial point of view in a new industrial development plan in only one case (Asturias region). This plan links to the region's industrial (coal/oil/chemistry) past, which seeks alternative products and production

²⁹ A more detailed overview is given in Annex 1.

methods for the future. Andalucía, Extremadura and Castilla-La Mancha seem to apply the most holistic view on the bioeconomy, while Castilla y León puts the focus on the agri-food sector. Andalucía, Galicia and Canary Islands highlight the blue sector. Catalunya and País Vasco connect their strong agri-food sectors to industrial transition and new energy sources.



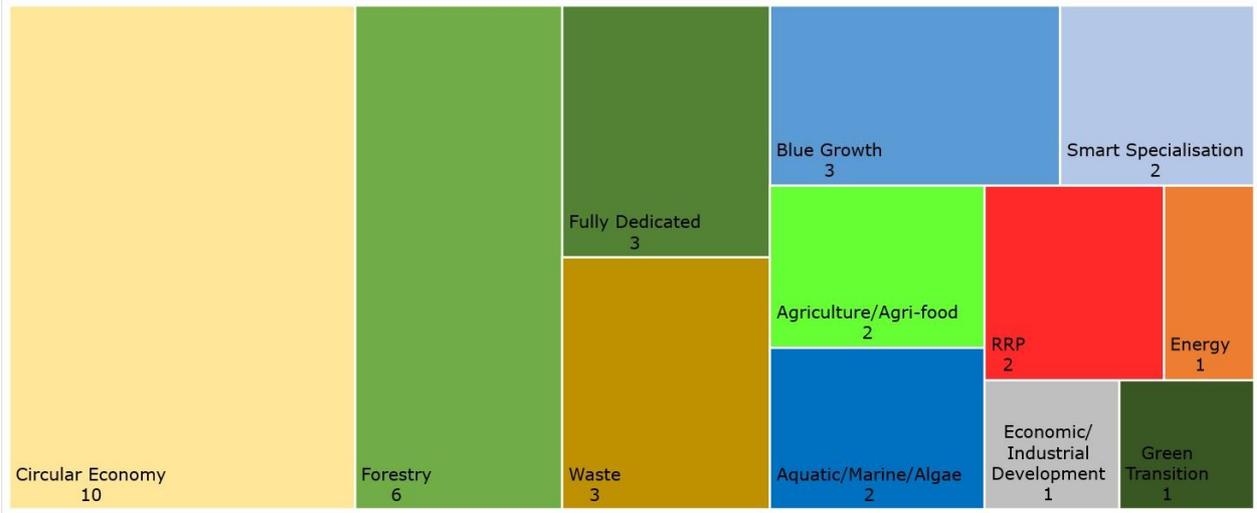
Bioeconomy is also included in the plans of many of the 2021-2027 Smart Specialisation Strategies at regional level. However, not all documents were readily available to be revised at the time of this report. Sometimes, bioeconomy is even an essential element of new recovery and resilience plans at regional or local level.

Presumably, between 2019-2021 some regions worked to have their first strategy related to bioeconomy actually embedded in a wider framework (on circular economy, blue growth, green transition or sustainable development), while other regions already had their initial bioeconomy strategies generated in the years 2016-2018. Furthermore, the latter documents were then integrated into wider strategic frameworks and into Smart Specialisation Strategies.

Overall, 42 regional and local strategies related to bioeconomy deployment could

be identified for Spain. Of those, 36 are already published, while 6 are under development. Of all the strategies, 3 are fully dedicated bioeconomy strategies or roadmaps (Andalucía, Catalunya and Castilla y León).

There are 16 strategic frameworks where bioeconomy plays a key role which are sectoral strategies: 7 on forestry, 3 on agriculture/agri-food, 3 on organic or biowaste, 2 on aquaculture and 1 on energy.



In 23 cases, the bioeconomy is promoted within a wider strategic framework. It is related to a circular economy strategy 13 times, 3 times to a Smart Specialisation Strategy, 3 times to a blue growth/transition strategy, once to a green transition strategy, once to a wider industrial development strategy, twice to a regional/local Recovery and Resilience Plan. Out of the 39 sectoral/embedded strategies, bioeconomy is a key element in 15.

All strategies, except one, have been found at NUTS 2 level, the level of the autonomous regions. One document refers to a NUTS 3 region; this is the case of the Circular Mallorca Strategy (within the NUTS 2 region of Balearic Islands).

Comunidad de Madrid is the only region without regional bioeconomy-relevant strategies. For Comunidad Valenciana, only a wider framework was found. In any case, according to the survey conducted, it seems that several strategies are under development in these two regions, which were not included in the present mapping.

A table included in Annex 1 (Table 27) shows the detailed distribution of regions and strategies.

Table 21 Spanish regions and their bioeconomy strategies

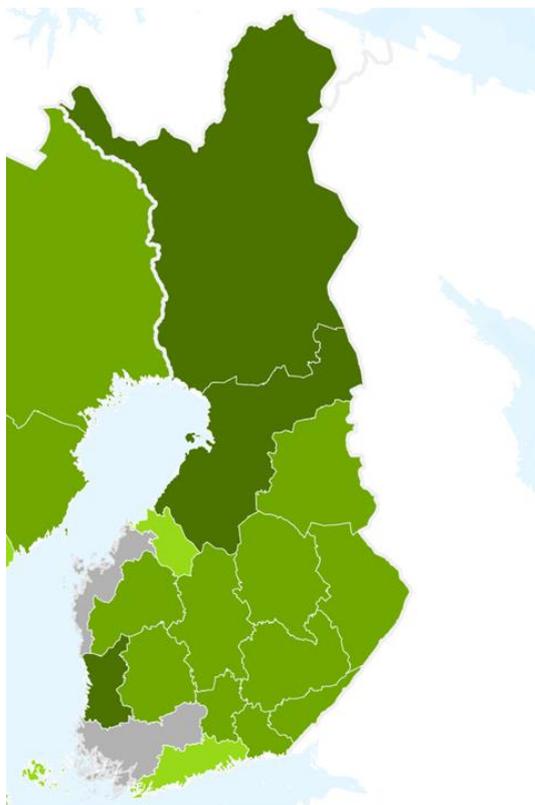
Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country *
Published	Under development	Published	Under development	Published	Under development		
3 Castilla y Leon Cataluña Andalucía	--	6 Galicia Asturias Pais Vasco Castilla-La Mancha Extremadura Canarias	1 Cantabria	5 Navarra La Rioja Aragon Com.Valenciana Mallorca	2 Illes Balears Murcia	16 NUTS2 and 1 NUTS3	19 NUTS 2 and 59 NUTS 3

* The mapping for Spain was carried out at NUTS 2 level. However, one of the identified regions with a bioeconomy strategy has a different NUTS level (NUTS 3), so the full breakdown is presented. Thus, the relative share of regions with bioeconomy strategies at NUTS 2 level should be considered with caution as it may not be representative.

5.3.2 Finland

Summary

- National Bioeconomy Strategy adopted in 2014 and updated in 2022.
- 16 regions (NUTS3) have published strategies related to the bioeconomy.
 - 3 regions with a full bioeconomy strategic framework.
 - 10 regions have documents with a strong bioeconomy focus.
 - 3 have frameworks with minimum bioeconomy content.
- 38 strategies have been identified at regional and local level, mostly at NUTS 3 level. 37 are published, 1 under development.
 - 3 fully dedicated bioeconomy strategies.
 - 31 have bioeconomy embedded into wider strategic frameworks (mostly in Smart Specialisation Strategies (S3), territorial development plans or in climate/low-carbon strategies).
 - 4 are sectoral strategies (mostly on forestry).



Regions with regional strategies
Role of Bioeconomy in the strategy and strategy status [published / under development]

- Strategy fully dedicated to bioeconomy
- Bioeconomy is one of the key elements
- Strategy with minimum bioeconomy content

Finland has set the course for a low-carbon and resource-efficient society and a sustainable economy. A sustainable bioeconomy plays a key role in achieving this goal. The Finnish national Bioeconomy Strategy 2015-2025 was adopted in 2014 and updated in 2022³⁰.

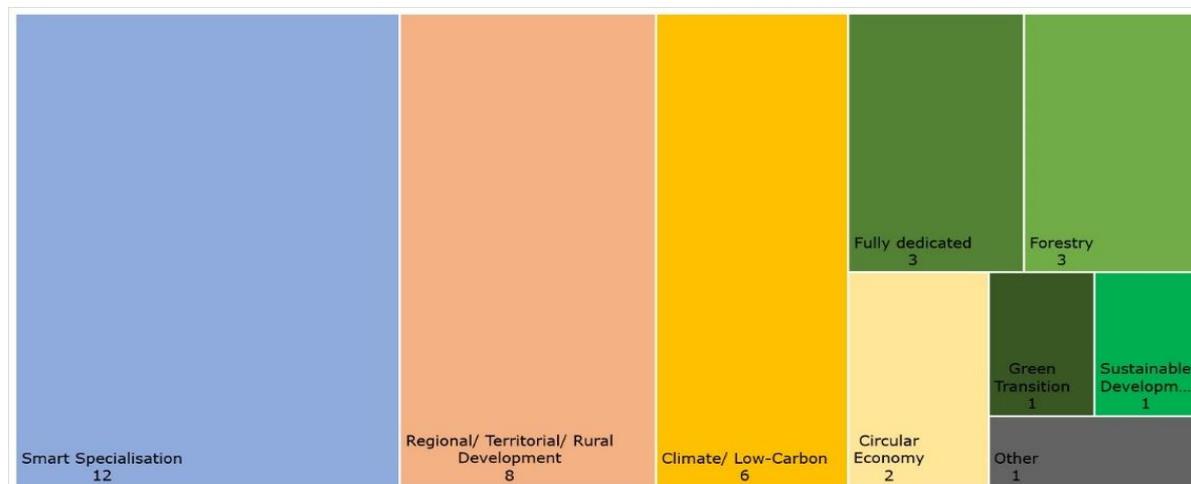
The national strategies and roadmaps indicate the main framework for national and also regional actions. However, at NUTS 3 level (regional councils formed by local municipalities), relevant development strategies (long-term) and programmes (4-year period) exist. Smart Specialisations Strategies (S3) are also usually formulated at NUTS 3 level.

Of the 19 Finnish NUTS 3 regions, 16 regions have a bioeconomy-relevant strategic framework. There is a clear pattern followed by almost all regions. Bioeconomy is a policy priority and is routinely included in regional development and innovation strategies at NUTS 3 regional level. Most strategies focus on forestry and forest bio-based products, but also on agri-food, and water. The Finnish Forest Centre has developed forest programmes for various regions in Finland – not always corresponding to NUTS 2 or 3 regions - for the years 2021-2025. Only one has been identified so far. Overall, the industrial component of the bioeconomy in Finland is rather high, meaning that the focus is not only on biomass production, but already on exploiting industrial use (including biorefinery) of all side-

streams and by-products of biological resources. In the context of the desk research for

³⁰ <https://julkaisut.valtioneuvosto.fi/handle/10024/163969>

this study, 38 strategies at regional level (all NUTS 3) could be identified for Finland, covering bioeconomy in some way or another. Many regions included bioeconomy aspects in their regional programmes and/or S3 documents. Some of the regions have separate bioeconomy or circular economy related plans linked to respective regional development strategies. Some regions have strategic documents committing to achieving low-carbon and zero-oil objectives by 2030-2040-2050.



Among the 38 strategies, there are 3 documents fully dedicated to bioeconomy and 4 sectoral strategies (3 on forestry and wood-products, 1 on biogas/energy), while 31 documents cover the bioeconomy topic as being embedded in a wider strategic framework (12 in Smart Specialisation Strategies, 8 in Regional Development Plans, 6 in climate plans or low-carbon strategies, 2 in circular economy strategies, 1 in a green growth/Green Deal roadmap and 1 in a sustainable development strategy, while 1 is embedded into a document covering different strategies for regional development). Of the 38, bioeconomy is the main topic in 3 strategies, it is a key element in 23 documents, it plays a minor role or is only mentioned in 11 documents (the situation is unclear for 1 document due to missing information). Information has been found on 37 existing strategies and 1 under development. However, it can be assumed that many more documents are under development or in the process of being updated (e.g. Regional Development Plans or Smart Specialisation Strategies).

Table 22 Finnish regions and their bioeconomy strategies

Regions with a dedicated framework fully on bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 3)
Published	Under development	Published	Under development	Published	Under development		
3 Satakunta Lappi Pohjois-Pohjanmaa	--	10 Keksi-Suomi Etelä-Pohjanmaa Pirkanmaa Päijät-Häme Kymenlaakso Etelä-Karjala Pohjois-Kareja EteläSavo Pohjois-Savo Kainuu	--	3 Helsinki-Uusimaa Keksi-Pohjanmaa Ahvenanmaa	--	16	19

5.3.3 France

Summary

- A national strategy for bioeconomy (2017) is in place.
- 18 regions (13 NUTS 1 level and all 5 outermost regions at NUTS 2 level) have published strategies related to the bioeconomy.
 - 3 regions with a fully dedicated bioeconomy strategy.
 - 13 regions have a regional strategy with a strong bioeconomy focus.
 - 2 regions have regional strategies with minimum bioeconomy content.
- 34 strategies were identified at regional level. 33 are published, 1 under development.
 - 3 fully dedicated bioeconomy strategies.
 - 14 strategies have bioeconomy embedded into wider strategic frameworks, mostly in economic development strategies and circular economy plans.
 - 17 sectoral strategies, mostly on agriculture, energy and forestry.

France has had a national bioeconomy strategy in place since January 2017. It defines a framework for the sustainable development of the bioeconomy, consistent with the resources of the territory and its needs, avoiding any overexploitation. Its aim is to make the products of the bioeconomy a market reality. An action plan has broken down this strategy into 49 actions, divided into 5 areas, to deploy the bioeconomy in France in an operational manner over the period 2018-2020. This plan essentially concerns the non-food part of the bioeconomy. The action plan is being updated at the time of this mapping. The action plan supports local and regional authorities in their efforts to develop a bioeconomy, for example by developing regional bioeconomy strategies.



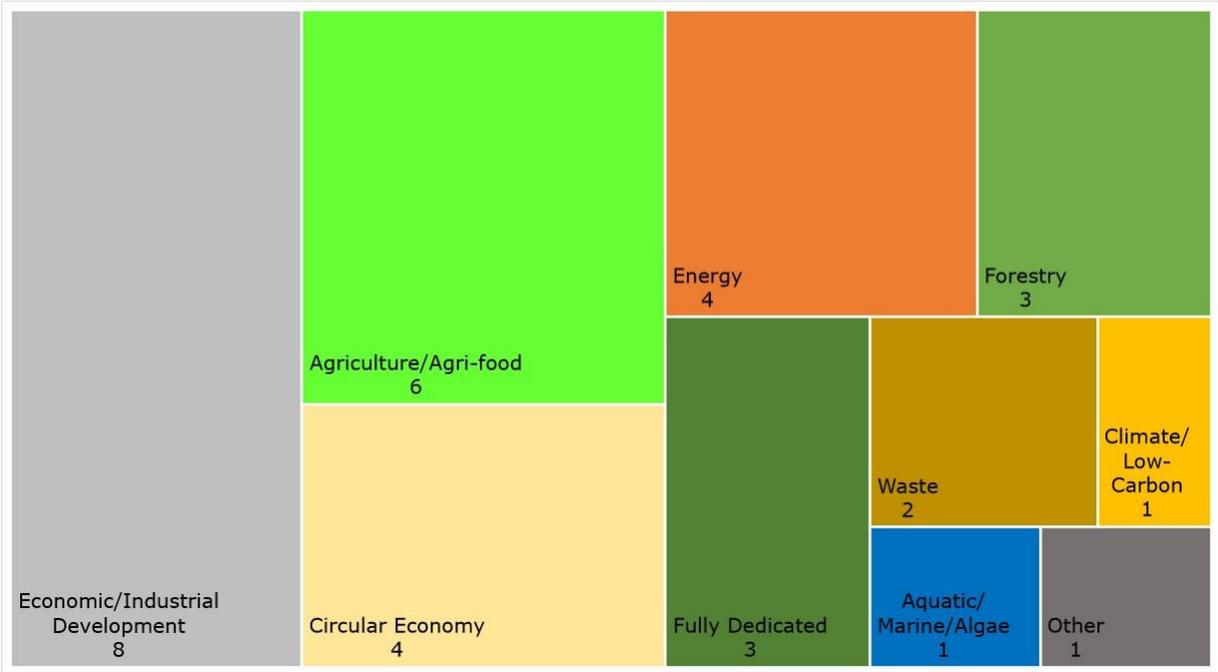
Since 2015, the 14 French NUTS 1 regions have had the exclusive competency for several domains concerned with bioeconomy (economic development, innovation, environment etc.), making them particularly relevant to the development of the bioeconomy. Regional authorities – such as the Regional Directorates for Agriculture, Agri-food and Forests (in French DRAAF) or the Regional Directorate for the Environment, Development and Housing (in French DREAL)³¹ – were often involved in the development of regional bioeconomy-relevant strategies.

Within the framework of this study, territories that have been analysed cover the 13 continental regions (NUTS-1) and the 5 French outermost regions (NUTS 2 level). The study shows all 18 regions have bioeconomy-relevant strategies. Three of them have fully dedicated bioeconomy

³¹ These regional directorates directly depend (respectively) on the Ministry of Agriculture and the Ministry of Ecological Transition.

strategies: Pays de la Loire, Alsace-Champagne-Ardenne-Lorraine and Nord-Pas-de-Calais-Picardie. Twelve have strategies with a strong bioeconomy focus, while 3 have minimum bioeconomy content. A table included in Annex 1 (Table 28) shows the distribution of regions and strategies.

Bioeconomy at regional level is often explicitly mentioned in two of the mandatory regional schemes, namely the Economic Development Strategy for Innovation and Internationalisation (SRDEII) and in regional circular economy strategies. Many regions also have a biomass strategy that relates to either agriculture, forestry or organic waste.



Overall, 34 strategies, action plans and master plans were identified for this study. In total, three strategies were identified that were fully dedicated to bioeconomy. Eighteen published strategies have a strong focus on bioeconomy, whereas 12 have minimum bioeconomy content. In addition to the three dedicated bioeconomy strategies, 14 strategies embed the bioeconomy in wider strategic frameworks. These strategies are mainly economic/industrial development strategies (8) or circular economy strategies (4). Bioeconomy-related issues are also found in one climate/climate change/low-carbon strategy and in one Smart Specialisation Strategy. Bioeconomy is also integrated into 17 sectoral strategies, mostly on agriculture (6), but also on forestry (3), energy (4), waste (2), construction (1) and algae (1).

Generally, strategies and actions within the bioeconomy are related to the use of biomass (forestry and agricultural use) and energy, as it is perceived as more accessible and more promising. The number of strategies covering the bioeconomy related themes (forest, biomass resources, economic development, innovation, circular economy, energy, waste management plans, agricultural, maritime) is quite large. The role of the bioeconomy within these strategies is addressed differently from one region to another. The cross-cutting nature of the topic also explains why there are rarely any budgets solely dedicated to bioeconomy. Instead, a 'multi-funds' approach seems to be used.

According to this mapping, the most active regions in terms of bioeconomy actions are Grand Est and Pays de la Loire with a dedicated team and a budget goal. Interestingly, the Pays de la Loire region developed its bioeconomy strategy as part of an Interreg project.

Despite the existence of bioeconomy-related documents in the outermost regions, it can be noted that the overseas departments and regions do not prioritise the development of

a bioeconomy as such, even though their economy often relies on blue economy and tourism, for example.

Table 23 French regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country*
Published	Under development	Published	Under development	Published	Under development		
3 Pays de la Loire Alsace- Champagne- Ardenne- Lorraine Nord-Pas de Calais- Picardie	--	13 Bretagne Normandie Centre — Val de Loire Bourgogne- Franche- Comté Ile-de- France Provence- Alpes-Côte d’Azur Auvergne- Rhône-Alpes Languedoc- Roussillon- Midi- Pyrénées Corse Guyane Guadeloupe La Réunion Mayotte	--	2 Aquitaine- Limousin- Poitou- Charentes Martinique	--	13 NUTS 1 and 5 NUTS 2	13 NUTS 1 and 27 NUTS 2

*The mapping for France was carried out at NUTS 1 level. However, five of the identified regions with a bioeconomy strategy have different NUTS levels (NUTS 2), so the full breakdown is presented. Thus, the relative share of regions with bioeconomy strategies at NUTS 2 level should be considered with caution as it may not be representative.

NOTE: There is a 14th NUTS 1 region in France integrating all French outermost territories. However, as the five French outermost territories have been included in the mapping as individual NUTS 2 regions, the 14th NUTS 1 region has not been considered in this table.

5.3.4 Italy

Summary

- National bioeconomy strategy updated in 2019.
- 21 regions have strategies related to the bioeconomy (2 of them with strategies under development).
 - 6 regions with fully dedicated bioeconomy strategies.
 - 9 regions have a regional strategy with a strong bioeconomy focus (7 of them published).
 - 6 regions have frameworks with minimum of bioeconomy content.
- 37 strategies have been identified at regional level, all at NUTS 2 level. 27 strategies are published, 10 under development.
 - 6 fully dedicated bioeconomy strategies.
 - 31 strategies have bioeconomy embedded in wider strategic frameworks, mostly in sustainable development strategies and Smart Specialisation Strategies (S3).
 - No sectoral strategies.

In Italy, there is a specific strategy fully dedicated to the bioeconomy at national level. Following an initial strategy in 2017, the current BIT II (Bioeconomy in Italy) was published in 2019 and provides a national assessment and strategic framework for the deployment and development of the bioeconomy in the country. The strategic document provides information indicating that the Italian bioeconomy relies on all major sectors of primary production (i.e. agriculture, forestry, fisheries and aquaculture); those processing biological resources, such as the food and drink, wood and pulp and paper industries along with biorefineries; and parts of the chemical, biotechnological, energy, marine and maritime industries. The core target of the strategy is achieving an increase of 15% in Italian bioeconomy performance by 2030 through: more investments in R&I, spin offs/start-ups, education, training, and communication; better coordination between regional, national and EU stakeholders/policies; better engagement with the public; as well as tailored market development actions.

The BIT II strategy has recently been (2021) been supplemented by the Implementation Action Plan (2020-2025) for the Italian bioeconomy strategy. The document consists of a detailed action plan, including a series of relevant targeted actions which have been clustered into 4 main macro areas (policy/standards, pilot actions, regeneration of ecosystem services and stakeholder' engagement). The pilot actions outlined at local level (rural, coastal and urban areas) prioritise the domains of agri-food, biorefinery, forestry, marine and maritime sectors, waste and waste waters.

At regional level, all 21 NUTS 2 regions have at least one strategic framework related to bioeconomy, even if in two regions (Sicilia and Umbria) the strategies are still under development at the time of this study. Six regions, namely Piemonte, Puglia, Basilicata, Sardegna, Veneto and Friuli-Venezia Giulia, have fully dedicated bioeconomy strategies. In 7 regions, there is a strategic framework where bioeconomy is a key element, while in 6 regions the identified strategic document only marginally covers the bioeconomy (i.e. with minimum bioeconomy content) and without further detail.

The bioeconomy plays a key role in the regional strategies for sustainable development and in regional Smart Specialisation Strategies. However, the bioeconomy can also emerge in the context of other overarching themes, e.g. circular economy or green transition.

Following a guidance document and a national framework strategy published in 2017, each Italian region is required to prepare an original strategy for sustainable development with a vision until 2030. Nine of the 21 (19 regions plus 2 provincial autonomous communities)



Regions with regional strategies
Role of Bioeconomy in the strategy and strategy status [published / under development]

- Strategy fully dedicated to bioeconomy
- Bioeconomy is one of the key elements
- Strategy with minimum bioeconomy content

regions analysed have published their regional strategies for sustainable development, where bioeconomy is typically one of the four core priorities of the strategic document. Two more regions have published a draft version. The remaining regions are currently in the process of strategy definition, with publication anticipated over the course of 2022. In most cases the regional strategies for sustainable development are the final result of a project (financed by national and regional sources) set up to create an extensive stakeholder engagement process, often involving citizen forums, for the strategy definition. The 10 strategies still under development today are in the final phases of the engagement process.

At the same time, many regions were preparing their Smart Specialisation Strategies at the time of the mapping. In some regions, the regional strategies for Smart Specialisation include important elements on bioeconomy and treat the bioeconomy as a priority. However, in other regions and documents the role of the bioeconomy in the document is minor.

Overall, 37 strategic frameworks have been identified at regional level for Italy. Of them, 6 are dedicated bioeconomy frameworks or strategies, while 31 are embedded in wider frameworks. Ten of the 37 strategies identified are under development or to be prepared in the next months. In 12 of the 31 embedded frameworks, bioeconomy plays a key role, while in 11 it is only mentioned or plays a small role. In those remaining, the bioeconomy status in the document is uncertain and not well explained, thus it could not be assessed.



Of the 27 strategies published, 6 are fully dedicated bioeconomy strategies, 10 cover the bioeconomy as embedded in sustainable development strategies, 9 of them in Smart Specialisation Strategies, 1 in a circular economy strategy and 1 in a green growth/transition strategy. No sectoral strategies exist.

The mapping of bioeconomy strategies also showed interesting results in terms of projects dedicated to the deployment of the bioeconomy. Whilst these do not constitute strategic frameworks, they can still be insightful for mapping bioeconomy at regional level. A total of 9 projects in as many regions are found in the field of bioeconomy. In most cases these projects are financed by European Structural and Investment Funds plus national, and sometimes regional, resources. More precisely, these projects typically consist of regional clusters, cluster agencies and technology platforms for bioeconomy. In addition, results have shown that two Italian regions participate in transnational European projects (Interreg) concerning the bioeconomy.

A table included in Annex 1 (Table 29) shows the detailed distribution of regions and strategies.

Table 24 Italian regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 2)
Published	Under development	Published	Under development	Published	Under development		
6 Piemonte Puglia Basilicata Sardegna Veneto Friuli-Venezia Giulia	--	7 Lombardia Campania P.A. di Bolzano P.A. di Trento Toscana Marche Lazio	2 Sicilia Umbria	6 Valle d'Aosta Liguria Abruzzo Molise Calabria Emilia-Romagna	--	21	21

5.3.5 Poland

Summary

- National strategy on bioeconomy under development. A roadmap on circular economy exists with bioeconomy as one of its pillars (2018).
- 16 regions (15 NUTS 2 and 1 NUTS 1) have strategies related to the bioeconomy (15 of them published, 1 under development).
 - 1 region with a fully dedicated strategic framework on bioeconomy.
 - 1 region has a regional strategy with a strong bioeconomy focus.
 - 14 regions have strategies with a minimum bioeconomy content.
- 32 strategies have been identified at regional level, all at NUTS 2 level. 31 strategies are published, 1 is under development.
 - 1 fully dedicated bioeconomy strategy under development.
 - In 15 cases, bioeconomy is embedded in wider strategic frameworks, usually in regional development or regional innovation strategies.
 - 16 are sectoral strategies (mostly on waste).

At national level, a dedicated bioeconomy strategy is under development within the framework of the BIOEAST Initiative. However, Poland is also deploying a Circular Economy Roadmap (2018), which includes an initiative on the bioeconomy. The roadmap focuses, among others, on sustainable industrial production, sustainable consumption and new business models.



Regions with regional strategies	
Role of Bioeconomy in the strategy and strategy status [published / under development]	
	Strategy fully dedicated to bioeconomy
	Bioeconomy is one of the key elements
	Strategy with minimum bioeconomy content

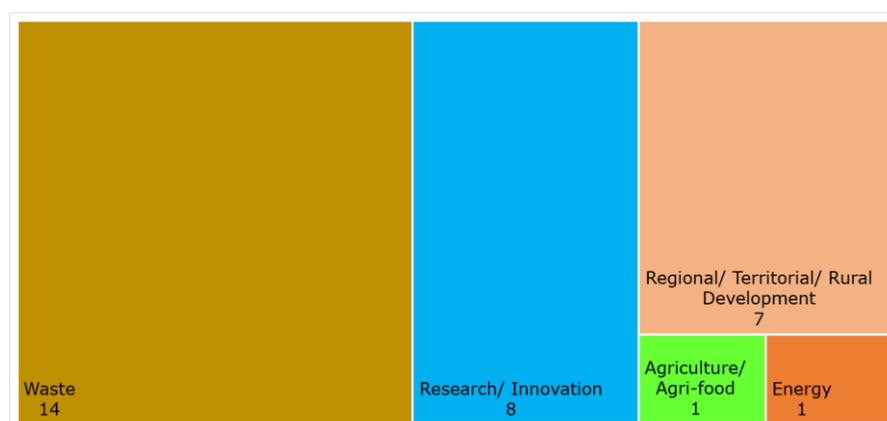
In Poland there are 16 regions (i.e. 15 of the existing 17 NUTS 2 regions and 1 NUTS 1 region) with bioeconomy-relevant strategies: 1 region (NUTS 1) has a dedicated bioeconomy strategy under development, 1 region has a strategy with a strong bioeconomy focus (published), while 14 regions have strategies with minimum bioeconomy content (published).

The only strategy explicitly dedicated to bioeconomy identified in the desk review was the 'Strategy for bioeconomy development for the Mazowieckie Macro-region'. It includes the general strategy, definition, potentials, development and implementation of the bioeconomy in the region and defines output and result indicators to monitor its development.

Overall, 32 regional strategies were identified in Poland. Of those, 1 is a fully dedicated bioeconomy strategy (still under development).

Of the 31 strategic frameworks published, there are 16 sectoral strategies (14 in the field of waste, 1 for agriculture/agri-food and 1 for energy). At the same time bioeconomy

is included in 15 wider strategic frameworks, namely in 8 research and innovation strategies and in 7 regional/territorial development strategies.



The bioeconomy concept is generally represented in waste management plans (almost every region has a waste management plan). These strategies focus on waste reduction and management, recycling and energy generation using different kinds of waste as resource.

Bioeconomy elements have been identified in regional innovation strategies (based on technological development, renewable energies, circular economy and green growth). Some regional development strategies contain further, however very limited, elements on bioeconomy development. Further relevant strategies at regional level concern one recent 'Strategy for Agriculture and Rural Development in the Podkarpackie region' until 2030 and a programme for the development of the electricity sector including renewable energy sources in the Pomerania region until 2025 (from 2010).

A table included in Annex 1 (Table 30) shows the detailed distribution of regions and strategies.

Table 25 Polish regions and their bioeconomy strategies

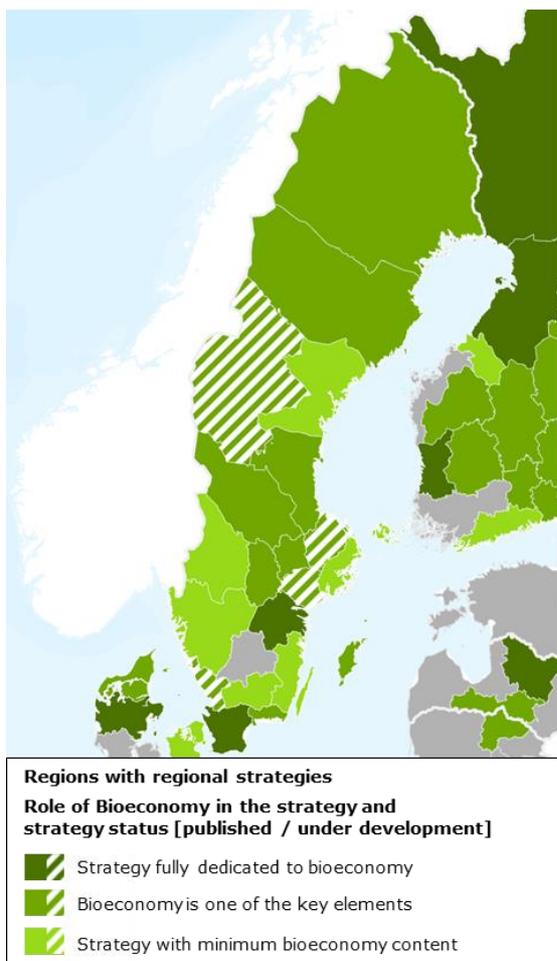
Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country*
Published	Under development	Published	Under development	Published	Under development		
--	1 Makroregion Województwo Mazowieckie	1 Pomorskie	--	14 Małopolskie Śląskie Wielkopolskie Zachodniopomorskie Lubuskie Dolnośląskie Opolskie Kujawsko-pomorskie Warmińsko-mazurskie Łódzkie Świętokrzyskie Lubelskie Podkarpackie Podlaskie	--	1 NUTS 1 and 15 NUTS 2	7 NUTS 1 and 17 NUTS 2

* The mapping for Poland was carried out at NUTS 2 level. However, one of the identified regions with a bioeconomy strategy has a different NUTS level (NUTS 1), so the full breakdown is presented. Thus, the relative share of regions with bioeconomy strategies at NUTS 2 level should be considered with caution as it may not be representative.

5.3.6 Sweden

Summary

- A national bioeconomy strategy is under development.
- 20 regions have strategies (all NUTS 3) related to the bioeconomy, of those 19 regions with published frameworks, a framework under development in 1 region.
 - 2 regions with a fully dedicated bioeconomy strategic framework.
 - 12 regions have a strategy with a strong bioeconomy focus (8 published, 4 under development)
 - 6 regions have strategies with minimum of bioeconomy content.
- 39 strategies have been identified at regional level. 35 of those published, 4 under development.
 - 2 fully dedicated strategies.
 - 22 are embedded in wider strategic frameworks, mostly in regional/territorial development plans.
 - 15 are sectoral strategies (all on forestry).



Sweden is currently elaborating its national bioeconomy strategy³². In addition, the country participates in the Nordic Bioeconomy macro-regional bioeconomy initiative.

At regional level, bioeconomy has been integrated into a wide range of different regional strategies in recent years. Most prominently, it has been addressed in all regional forestry strategies, primarily with a focus on wood, wood-based products and forestry biomass. Often, the focus is on the management of natural resources and economic competitiveness in the field. Furthermore, most regional development strategies touch upon the issues of bioeconomy, circular economy or the use of biomass. In addition to forestry issues, biofuel issues are highly prominent in the regional development strategies. Depending on the regional economic profile, other sectors of the bioeconomy are also addressed, e.g. construction, biomaterials, bioeconomy-related research and innovation, etc. Other regional strategies such as innovation strategies, Smart Specialisation Strategies, sustainable development strategies, also partly address bioeconomy features as well. However, these strategies cover the bioeconomy to a lesser extent in comparison to the forestry and

³² <https://www.skogsstyrelsen.se/om-oss/var-verksamhet/regeringsuppdrag/nationell-bioekonomi--strategi/> and <https://www.regeringen.se/artiklar/2021/01/dialogmote-om-bioekonomistrategin--tillsammans-skapar-vi-en-bioekonomi-i-varldsklass/>.

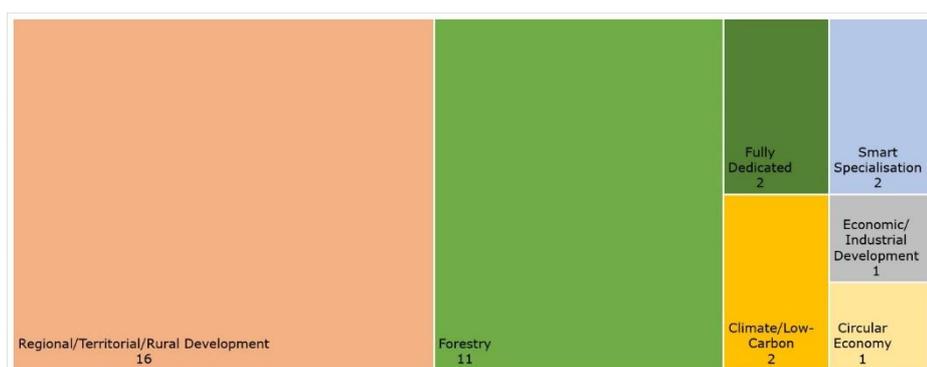
regional development strategies, and they are less consistently available in an updated version for all regions.

Of the 21 Swedish NUTS 3 regions, 20 regions have strategies related to the bioeconomy (19 with frameworks already published; 1 region with a framework under development).

Overall, 39 strategies have been identified for Sweden: 38 of them are at NUTS 3 level, which is the dominant administrative level for such regional strategies, 1 covers various regions in the country. Bioeconomy plays a major role in 14 sectoral strategies and a minor role in the 22 embedded strategies and in 1 sectoral framework.

Four of the 39 are still under development, and 35 are published.

Of the 35 published regional strategies, 2 are fully dedicated bioeconomy strategies, 11 are sectoral strategies (all on forestry) and 22 are embedded in wider strategic frameworks. Of



those 22, 16 are embedded in regional/rural development strategies, 2 in climate action plans, 2 in Smart Specialisation Strategies, 1 in an economic/industrial development strategy and 1 in a circular economy action plan.

All regional strategies reviewed are outlining the big development objectives and ideas. Only in very rare cases do they also detail more specific actions or monitoring indicators. In the cases when they do so, the main focus is on support from collaboration platforms of various kinds.

Table 26 Swedish regions and their bioeconomy strategies

Regions with a framework fully dedicated to bioeconomy		Regions with a strong bioeconomy focus in framework		Regions with minimum bioeconomy content in framework		Total no. of regions with strategies	Total no. of regions in the country (NUTS 3)
Published	Under development	Published	Under development	Published	Under development		
2 Östergötlands län Skåne län	--	8 Örebro län Västmanlands län Gotlands län Blekinge län Dalarnas län Gävleborgs län Västerbottens län Norrbottens län	4 Uppsala län Södermanlands län Hallands län Jämtlands län	6 Stockholms län Kronobergs län Kalmar län Västra Götalands län Värmlands län Västernorrlands län	--	20	21

NOTE: One of the Swedish strategies could not be aligned with one region. It was not included in this table (Småland med öarna) as it covers various regions in the country.

5.4 Other strategies

While the focus was on regional strategies, the mapping also identified several multi-regional strategies, i.e. strategic frameworks that cover several regions in one country³³ or in different countries.

Multi-regional strategies in one country

Apart from the regional strategies, 4 strategies that cover multiple regions in one country have been identified: Zuid-Holland in NL and Metropolregion Frankfurt in DE, Pinhal Interior in Portugal and Småland med öarna in Sweden. These strategies have not been included in the quantitative analysis of regional strategies per se, as it was not possible to assign them to one NUTS code. They have, however, been mentioned in the country-specific analysis and are included in the database under their respective countries.

Macro-regional and interregional strategies covering regions from different countries

Additionally, 10 strategies with macroregional, interregional or cross-border coverage have been identified and are included in the database. These are not assigned to any country.

→ 5 of them have macroregional coverage, proposing bioeconomy actions and development in the Baltic Sea Region, the Alps, the Danube Region, the Adriatic-Ionian Region and the Macaronesia Region covering the Canary Islands, Madeira and Azores. The latter covers the bioeconomy as part of a transnational Smart Specialisation Strategy. All five have been developed within the context of Interreg projects.

→ 2 bioeconomy strategies have a transnational character (for the Nordic countries and for North-West Europe).

→ 2 bioeconomy strategies have cross-border coverage (Germany-Netherlands and Sweden-Norway); they have again benefitted from the work in Interreg Programmes.

→ 1 action plan has interregional coverage. The Vanguard Pilot Action Plan on bioeconomy covers different regions all across Europe.

Nine of these strategies are fully dedicated to the bioeconomy. One has a strong focus on bioeconomy and is embedded in an interregional Smart Specialisation Strategy.

Notably, the European Territorial Cooperation Programmes (Interreg) are the motor behind all multi-regional strategies that cover regions from different countries.

Similarly, during this mapping, the multi-country BIOEAST Initiative was identified as highly relevant to the development of bioeconomy strategies in eastern and central European countries. BIOEAST not only focuses on the regional level but also on national stakeholders. The initiative is supported by the European Union's Horizon 2020 Programme for Research and Innovation. The initiative itself has not been included in the database and analysis, as it is an overarching initiative that supports regional strategies. However, several regional strategies developed under BIOEAST have been included in the database and in the analysis within the context of their corresponding countries.

³³ In this case it refers to cases where the regions involved in one country do not automatically correspond to one territorial unit with a specific NUTS code.

References

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European Commission (2018a), A sustainable Bioeconomy for Europe: Strengthening the connection between economy, society and the environment, Communication from the Commission, Brussels, 11.10.2018, COM (2018) 673 final

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European Commission's Knowledge Centre for Bioeconomy
https://knowledge4policy.ec.europa.eu/bioeconomy_en

List of abbreviations and definitions

EAFRD	European agricultural fund for rural development
EC	European Commission
ERDF	European Regional Development Fund
EU	European Union
JRC	Joint Research Centre
NUTS	Nomenclature of territorial units for statistics
R&I	Research and Innovation
RIS3	Research and Innovation Strategies for Smart Specialisation
S3	Smart Specialisation Strategy (ies)
SME	Small and medium-sized enterprises

Country abbreviations

AT	Austria	IE	Ireland
BE	Belgium	IT	Italy
BG	Bulgaria	LT	Lithuania
CY	Cyprus	LU	Luxembourg
CZ	Czechia	LV	Latvia
DE	Germany	MT	Malta
DK	Denmark	NL	The Netherlands
EE	Estonia	PL	Poland
EL	Greece	PT	Portugal
ES	Spain	RO	Romania
FI	Finland	SE	Sweden
FR	France	SI	Slovenia
HR	Croatia	SK	Slovakia
HU	Hungary		

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Annexes

Annex 1. Regional overview tables on bioeconomy strategies for selected countries

Table 27 Spain. Regions per country with bioeconomy strategies

Region	No. of strategies (published/under development)	Dedicated, strong focus or minimum bioeconomy content	Embedded or sectoral
Galicia	4 published	2 have a strong focus, 2 minimum content	3 sectoral (2 forestry, 1 aquaculture), 1 embedded (circular)
Asturias	3 published	1 strong focus, 2 minimum content	1 sectoral (forestry), 2 embedded (S3, industrial development)
Cantabria	1 under development	Probably a strong focus on bioeconomy	Probably embedded in circular economy strategy
Pais Vasco	3 published	2 have a strong focus, 1 minimum content	1 sectoral (forestry), 2 embedded in circular economy topic
Navarra	2 published	2 have minimum bioeconomy content	2 embedded (circular economy and green transition)
La Rioja	1 published	1 with minimum content	1 embedded (Recovery and Resilience Plan)
Aragon	1 published	1 with minimum content	1 embedded (circular economy)
Castilla y Leon	5 published	1 dedicated, 3 strong focus and 1 with minimum content	1 exclusively on bioeconomy, 2 sectoral (agriculture) and 2 embedded (S3 and circular economy)
Castilla-La Mancha	5 published	2 with a strong bioeconomy focus, 3 with minimum content	3 sectoral (forestry, energy, organic waste), 2 embedded (both circular economy)
Extremadura	1 published, 1 under development	Both have a strong focus	1 sectoral (forestry, under development) and 1 embedded (circular economy)
Catalunya	3 published	1 dedicated, 1 strong focus, 1 minimum content	1 exclusively on bioeconomy, 1 sectoral (forestry) and 1 embedded (blue growth/transition)
Com. Valenciana	1 published	1 with minimum content	1 sectoral (waste)
Iles Balears	1 under development	Not yet clear	Probably embedded in circular economy strategy
Murcia	1 under development	Not yet clear	Probably embedded in circular economy strategy
Mallorca	1 published	1 with minimum content	Embedded in a Recovery and Resilience Plan
Andalusia	4 published	1 dedicated, 3 with minimum content	1 exclusively on bioeconomy, 2 sectoral (waste and aquaculture) and 1 embedded (blue growth)
Canarias	2 published, 2 under development	2 (published) with a strong focus on bioeconomy, 2 with minimum content (expected)	1 sectoral (agrifood), 3 embedded (blue growth, circular economy, S3)

Table 28 France. Regions per country with bioeconomy strategies

Region	No. of strategies (published/under development)	Dedicated, strong focus or minimum bioeconomy content	Embedded or sectoral
Pays de la Loire	3 published	1 dedicated, 2 with a strong focus	1 embedded in a circular economy strategy, 1 sectoral on algae
Bretagne	2 published	1 with a strong focus, 1 with minimum content	1 embedded in a circular economy strategy, 1 sectoral on agriculture
Normandie	2 published	2 with a strong focus	1 embedded in a circular economy strategy, 1 sectoral on forestry
Aquitaine-Limousin-Poitou-Charentes	1 published	1 with minimum content	1 embedded in a low carbon strategy
Centre-Val de Loire	3 published	1 with strong focus, 2 with minimum content	1 embedded in a circular economy strategy, 2 sectoral on agriculture and waste
Alsace-Champagne-Ardenne-Lorraine	2 published, 1 under development	1 dedicated, 2 with minimum content	1 embedded in S3 and 1 in economic development strategy
Nord-Pas-de-Calais-Picardie	2 published	1 dedicated, 1 with minimum content	1 embedded in economic development strategy
Bourgogne-Franche-Comté	3 published	2 with strong focus, 1 with minimum content	1 embedded in economic development strategy, 2 sectoral on agriculture and construction
Île-de-France	2 published	1 with strong focus, 1 with minimum content	1 embedded in economic development strategy, 1 sectoral on agriculture
Provence-Alpes-Côte d'Azur	2 published	1 with strong focus, 1 with minimum content	1 embedded in economic development strategy, 1 sectoral on agriculture
Auvergne-Rhône-Alpes	2 published	1 with strong focus, 1 with minimum content	1 embedded in economic development strategy, 1 sectoral on agriculture
Languedoc-Roussillon-Midi-Pyrénées	2 published	1 with strong focus, 1 with minimum content	1 embedded in economic development strategy, 1 sectoral on agriculture
Corse	1 published	1 with strong focus	1 sectoral on energy
Guyane	2 published	1 with strong focus, 1 with minimum content	1 embedded in economic development strategy, 1 sectoral on forestry
Guadeloupe	1 published	1 with strong focus	1 sectoral on waste
Martinique	1 published	1 with minimum content	1 sectoral on energy
La Réunion	1 published	1 with strong focus	1 sectoral on energy
Mayotte	1 published	1 with strong focus	1 sectoral on energy

Table 29 Italy. Regions per country with bioeconomy strategies

Region	No. of strategies (published/under development)	Dedicated, strong focus or minimum bioeconomy content	Embedded or sectoral
Piemonte	2 published	1 dedicated, 1 with minimum content	1 embedded in sustainable development strategy
Valle d'Aosta	1 published, 1 under development	1 with minimum content, 1 unclear	Embedded in sustainable development strategy and S3
Liguria	1 published	1 with minimum content	Embedded in sustainable development strategy
Lombardia	1 published	1 with a strong focus	Embedded in sustainable development strategy
Abruzzo	1 published, 1 under development	1 with minimum content, 1 unclear	Embedded in sustainable development strategy and S3
Molise	1 published, 1 under development	1 with minimum content, 1 unclear	Embedded in sustainable development strategy and S3
Campania	1 published	1 with a strong focus	Embedded in S3
Puglia	1 published, 1 under development	1 dedicated (published), 1 unclear	1 embedded in sustainable development strategy
Basilicata	2 published	1 dedicated and 1 with a strong focus	1 embedded in S3
Calabria	1 published, 1 under development	1 with minimum content, 1 unclear	1 embedded in sustainable development strategy, 1 in S3
Sicilia	1 published, 2 under development	1 with a strong focus, 1 with minimum content, 1 unclear	2 embedded in sustainable development strategy and 1 in S3
Sardegna	2 published	1 dedicated, 1 with a strong focus	Embedded in sustainable development strategy
Provincia Autonoma di Bolzano	2 published	2 with a strong focus	Embedded in circular economy strategy and sustainable development strategy
Provincia Autonoma di Trento	1 published	1 with a strong focus	Embedded in sustainable development strategy
Veneto	2 published	1 dedicated, with minimum content	Embedded in sustainable development strategy
Friuli-Venezia Giulia	2 published, 1 under development	1 dedicated, 1 with minimum content, 1 unclear	Embedded in sustainable development strategy and S3
Toscana	1 published	1 with a strong focus	Embedded in sustainable development strategy
Emilia-Romagna	1 published, 1 under development	1 with minimum content, 1 unclear	Embedded in sustainable development strategy and green transition plan
Umbria	1 published, 1 under development	1 with a strong focus, 1 unclear	Embedded in sustainable development strategy and S3
Marche	1 published	1 with a strong focus	Embedded in sustainable development strategy
Lazio	1 published	1 with a strong focus	Embedded in sustainable development strategy

Table 30 Poland. Regions per country with bioeconomy strategies

Region	No. of strategies (published/under development)	Dedicated, strong focus or minimum bioeconomy content	Embedded or sectoral
Makroregion Województwo Mazowieckie	1 under development	1 dedicated	full
Małopolskie	3 published	3 with minimum content	1 embedded in regional development, 1 embedded in regional innovation, 1 sectoral on waste
Śląskie	3 published	3 with minimum content	1 embedded in regional development, 1 embedded in regional innovation, 1 sectoral on waste
Wielkopolskie	3 published	3 with minimum content	1 embedded in regional development, 1 embedded in regional innovation, 1 sectoral on waste
Zachodniopomorskie	1 published	1 with minimum content	1 sectoral on waste
Lubuskie	3 published	3 with minimum content	1 embedded in regional development, 1 embedded in regional innovation, 1 sectoral on waste
Dolnośląskie	2 published	2 with minimum content	1 embedded in regional innovation, 1 sectoral on waste
Opolskie	2 published	2 with minimum content	1 embedded in regional innovation, 1 sectoral on waste
Kujawsko-pomorskie	1 published	1 with minimum content	1 sectoral on waste
Warmińsko-mazurskie	1 published	1 with minimum content	1 sectoral on waste
Pomorskie	2 published	1 with strong focus, 1 with minimum content	2 sectoral on energy and waste
Łódzkie	2 published	2 with minimum content	1 embedded in regional development, 1 sectoral on waste
Świętokrzyskie	2 published	2 with minimum content	1 embedded in regional development, 1 sectoral on waste
Lubelskie	2 published	2 with minimum content	1 embedded in regional innovation, 1 sectoral on waste
Podkarpackie	3 published	3 with minimum content	1 embedded in regional development, 2 sectoral on agriculture and waste
Podlaskie	1 published	1 with minimum content	1 embedded in regional development

Annex 2. List of URL references to strategies per country

AUSTRIA

Kärnten	Waste management concept Carinthia https://www.ktn.gv.at/Service/Amtliche-Informationen?kid=16
Niederösterreich	FTI-strategy for Lower Austria https://www.noel.gv.at/noel/Wissenschaft-Forschung/FTI27_web.pdf Waste management plan Lower Austria https://www.noel.gv.at/noel/Abfall/NOE_Abfallwirtschaftsplan_2018_online.pdf
Oberösterreich	#upperVision2030 business and research strategy Upper Austria 2030 https://www.uppervision.at/fileadmin/user_upload/Projektwebsites/uppervision/2021/PDF/biz_uppervision2030_programm2021_web.pdf Waste management plan Upper Austria https://www.land-oberoesterreich.gv.at/files/publikationen/us_auwr_Landesabfallwirtschaftsplan2017_09102017.pdf
Salzburg	Scientific and Innovation Strategy Salzburg 2025 https://www.salzburg.gv.at/wirtschaft/_Documents/wiss-langfassung.pdf
Steiermark	Economic Strategy Styria 2025 https://www.verwaltung.steiermark.at/cms/dokumente/11685083_74838386/ff7e3290/Wirtschaftsstrategie2025_DE.pdf Waste management plan Styria https://www.abfallwirtschaft.steiermark.at/cms/dokumente/10177492_136078548/c1d2cdf8/LAWP2019-20200125_WEB_SRGB.pdf
Tirol	Tyrolian research and innovation strategy https://www.tirol.gv.at/fileadmin/themen/arbeit-wirtschaft/wirtschaft-und-arbeit/downloads/Tiroler_Forschungs- und_Innovationsstrategie.pdf Tyrolian sustainability and climate strategy https://www.tirol.gv.at/fileadmin/themen/landesentwicklung/raumordnung/Nachhaltigkeit/Nachhaltigkeits- und Klimakoordination/Publikationen/Nachhaltigkeits- und-Klimastrategie_2021.pdf
Vorarlberg	Waste management plan Vorarlberg https://www.arge.at/Downloads/4_Landesabfallwirtschaftsplan_Vorarlberg_2017.pdf
Wien	Vienna 2030 - Economy and Innovation https://www.digital.wienbibliothek.at/wbrup/download/pdf/2711392?originalFilename=true Waste management plan Vienna https://www.wien.gv.at/umwelt/ma48/service/pdf/awp-avp-19-24.pdf

BELGIUM

Région de Bruxelles capitale/ Brussels Hoofdstedelijk Gewest	2030 Energy and Climate Plan https://environnement.brussels/thematiques/batiment-et-energie/bilan-energetique-et-action-de-la-region/plan-energie-climat-pnec Regional Innovation Plan 2021-2027 (S3) https://innoviris.brussels/sites/default/files/documents/innoviris_plan_regional_innovation_pri_digital_fr.pdf Resource and Waste Management Plan 2018-2023 https://environnement.brussels/sites/default/files/user_files/pgrd_181122_fr.pdf
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Région Wallonie	<p>Circular Wallonia</p> <p>https://borsus.wallonie.be/files/EC%20Wallonia.pdf</p> <p>Development plan for biological production in Wallonia</p> <p>https://agriculture.wallonie.be/documents/20182/21894/Plan+Bio+2030.pdf/f432bdef-6b67-4da6-9ca7-bcac6ac7d39c</p> <p>Strategy for more sustainable heat consumption in Wallonia</p> <p>https://energie.wallonie.be/servlet/Repository/20210416-art14-rapport-final-gw.pdf?ID=62130&saveFile=true</p> <p>Wallonia Smart Specialisation Strategy (S3) 2021-2027</p> <p>https://economie.wallonie.be/content/le-gouvernement-adopte-la-nouvelle-strat%C3%A9gie-wallonne-de-sp%C3%A9cialisation-intelligente-s3-et</p> <p>Walloon Energy and Climate Plan (Walloon contribution to the national energy and climate plan)</p> <p>https://energie.wallonie.be/servlet/Repository/pwec-2030-version-definitive-28-novembre-2019-approuvee-par-le-gw.pdf?ID=58450</p>
Vlaams Gewest	<p>ACTION PLAN CIRCULARFOOD LOSS AND BIOMASS(RESIDUAL) FLOWS 2021-2025</p> <p>https://ovam.be/sites/default/files/atoms/files/210706%20English%20version%20VR%202021%200204%20DOC.%20Actieplan%20voedselverlies%20en%20biomassa%202021-2025%20EN_.pdf</p> <p>Bioeconomy in Flanders - vision, strategy and starting point for an action plan for a sustainable and competitive bio-economy by the Flemish government for 2030</p> <p>https://www.vlaanderen.be/publicaties/bio-economie-in-vlaanderen</p> <p>Flanders Circular</p> <p>https://vlaanderen-circulair.be/nl/topics/werkagenda-bio-economie</p> <p>Flemish bioeconomy policy</p> <p>https://www.ewi-vlaanderen.be/nieuws/beleidsplan-moet-bio-economie-verankeren-vlaanderen</p> <p>Flemish Climate Strategy 2050</p> <p>https://www.vlaanderen.be/publicaties/vlaamse-klimaatstrategie-2050</p> <p>Flemish Strategy for Sustainable Development</p> <p>https://do.vlaanderen.be/vlaamse-strategie-duurzame-ontwikkeling</p> <p>Vision 2050 - A long term strategy for Flanders</p> <p>https://www.vlaanderen.be/publicaties/visie-2050-eeen-langetermijnstrategie-voor-vlaanderen</p>
Småland med öarna	<p>Regional forest strategy for Småland</p> <p>https://skogstrasmaland.se/wp-content/uploads/2020/11/smaland-skoogsstrategi.pdf</p>
Zuid-Holland	<p>CO2 reduction with the Circular Biobased Delta - initiation for a roadmap for the period until 2030</p> <p>https://biobaseddelta.com/10-year-plan/</p>
CZECHIA	
Hlavní město Praha	<p>Prague Climate Plan until 2030 - Prague on the Road to Carbon Neutrality</p> <p>https://klima.praha.eu/DATA/Dokumenty/Klimaticky_plan_HMP_2030_revidovany_k_27_5_2021.pdf</p>
Jihočeský kraj	<p>POWER4BIO</p> <p>https://power4bio.eu/south-bohemia</p> <p>RIS3 Strategy of the South Bohemian Region 2021-2027</p> <p>http://www.risjk.cz/files/risjk/uploads/files/vystupy-projektu/15936853301-132-ris3-jk-aktualizace-ver-3062020-schvaleno-zk.pdf</p>

	Strategic Development Plan of the Smart Region South Bohemia for the period 2019-2023 https://www.databaze-strategie.cz/cz/jck/strategie/strategicky-plan-rozvoje-smart-regionu-jihoceskeho-kraje-2019-2023?typ=download
	Territorial Energy Concept of the South Bohemian Region (2018-2043) https://www.dataplan.info/img_upload/7bdb1584e3b8a53d337518d988763f8d/uek_jck-navrh-do-procesu-sea.pdf
Jihomoravský kraj	South Moravian Region Development Programme 2018-2021 https://www.databaze-strategie.cz/cz/jmk/strategie/program-rozvoje-jihomoravskeho-kraje-2018-2021?typ=download
Karlovarský kraj	Territorial Energy Concept of the Karlovy Vary Region (2017-2042) https://www.databaze-strategie.cz/cz/kvk/strategie/uzemni-energeticka-koncepce-karlovarskeho-kraje-2?typ=download
Kraj Vysočina	Development Strategy of the Vysočina Region 2021-2027 https://www.databaze-strategie.cz/cz/vys/strategie/strategie-rozvoje-kraje-vysocina-2021-2027?typ=download
Královéhradecký kraj	Hradec Králové Region smart region concept https://www.chytryregion.cz/koncepce_chytry_region Development Strategy of the Hradec Králové Region for the period 2021 - 2027 https://www.chytryregion.cz/strategie/final
Liberecký kraj	Development Strategy of the Liberec Region 2021-2027 https://www.databaze-strategie.cz/cz/lbk/strategie/strategie-rozvoje-libereckeho-kraje-2021-2027?typ=download
Moravskoslezský kraj	Development Strategy of the Moravian-Silesian Region 2019-2027 https://www.databaze-strategie.cz/cz/msk/strategie/strategie-rozvoje-moravskoslezskeho-kraje-2019-2027?typ=download
Olomoucký kraj	Development Strategy of the Olomouc Region 2021-2027 with an outlook to 2030 https://www.databaze-strategie.cz/cz/olk/strategie/strategie-rozvoje-uzemniho-obvodu-olomouckeho-kraje-2021-2027?typ=download
Pardubický kraj	Development Strategy of the Pardubice Region 2021-2027 https://www.pardubickykraj.cz/strategie-rozvoje-pardubickeho-kraje-2021-2027 Territorial Energy Concept of the Pardubice Region - 2018 update https://www.databaze-strategie.cz/cz/puk/strategie/uzemni-energeticke-koncepce-pardubickeho-kraje?typ=download
Středočeský kraj	Central Bohemian Region Development Strategy for the period 2019-2024 and outlook to 2030 https://www.kr-stredocesky.cz/documents/20541/17031810/SRK+2019+-+2024/d59a9153-ec0c-47ce-a8a8-d3cb03f7097c Territorial Energy Concept of the Central Bohemian Region (2019-2043) https://www.dataplan.info/img_upload/7bdb1584e3b8a53d337518d988763f8d/uek_sck.pdf

	https://www.saarland.de/muv/DE/portale/nachhaltigkeit/service/publikationen/pub_nachhaltigkeitsstrategie_muv.pdf?_blob=publicationFile&v=1
Sachsen	Innovation strategy for Saxony https://www.innovationsstrategie.sachsen.de/ Mission Saxony 2038. RECOMMENDATIONS OF THE SAXON INNOVATION BOARD FOR A FUTURE-FORWARDING STRUCTURAL DEVELOPMENT IN THE FREESTATE https://medienservice.sachsen.de/medien/medienobjekte/140671/download
Sachsen-Anhalt	Bioeconomy as a driver of value creation and innovation. Strategy paper on the key role of Saxony-Anhalt in establishing a model region for the bioeconomy in the Central German Mining Region. https://www.mitteldeutschland.com/wp-content/uploads/2021/06/010621_biooekonomie-strategiepapier.pdf
Weser-Ems	Masterplan Bioeconomy 2020 Weser-Ems https://www.weser-ems.eu/export/sites/default/wissensregion/assets/dl-biooekonomie/Masterplan_Biooekonomie_Weser-Ems.pdf
DENMARK	
Hovedstaden	Common strategic energy plan for the Capital Region https://www.gate21.dk/wp-content/uploads/2018/11/EPT_F%C3%A6lles-Strategisk-Energiplan_WEB.pdf
Midtjylland	Development programme for bioeconomy in Central Jutland https://www.rmbio.dk/ Sustainability Strategy 2030 https://www.rm.dk/siteassets/om-os/organisation/baredygtighed/strategi/rm---strategi-for-baredygtighed_enkeltidet_tilgangelig.pdf
Nordjylland	Green energy North Jutland 2040 No document yet Strategy 2020-2024 - Network for the contribution of sustainable business development to the green transition in North Denmark https://nben.dk/wp-content/uploads/2020/07/NBE-strategi-2020-2024_online.pdf
Sjælland	Measures and indicators for the Economic Commission of Guldborgsund municipality https://guldborgsund.dk/media/pefjdc4n/udvalgsstrategi_2019-22_oek.pdf Municipal plan 2019-2031 https://guldborgsund.viewer.dkplan.niras.dk/plan/19#/2434
GREECE	
Central Macedonia	Action Plan for the promotion of circular economy in SME of the Central Macedonia prefecture https://www.interregeurope.eu/fileadmin/user_upload/tx_tevprojects/library/file_1544096220.pdf Regional action plan for the promotion of circular bioeconomy
Crete	Smart Specialisation Strategy http://ris3.crete.gov.gr/
SPAIN	
Andalucía	Andalusian Circular Bioeconomy Strategy https://www.bioeconomiaandalucia.es/documents/1056091/1056698/Estrategia+Andaluza+Bioeconomia+Circular+%5BEABC%5D+%5B18.09.2018%5D/e0b87df0-73a8-43f2-ba9d-da0ad9b312e9 Andalusian Strategy for the Development of Marine Aquaculture

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Midland: Counties Laois, Longford, Offafy, Westmeath	Midland Regional Food and Drink Strategy https://issuu.com/midlandsireland.ie/docs/midlandsireland.ieregionalfood_drinkstrategy
Mid-West	Mid-West Regional Enterprise Plan https://enterprise.gov.ie/en/Publications/Mid-West-Regional-Enterprise-Plan-to-2020.html
Mid-West BAU region 2	Mid-West Business Area Unit (BAU) Five Year Forest Plan 2021-2025 http://www.coillte.ie/media/2021/02/B2-Mid-West-BAU-Forest-Plan-DRAFT-2021_2025.pdf
Northwest BAU region 1	Northwest Business Area Unit (BAU) Five Year Forest Plan 2021-2025 http://www.coillte.ie/media/2021/02/B1-Northwest-BAU-Forest-Plan-DRAFT-2021-2025.pdf
North-East	North-East Regional Enterprise Plan https://enterprise.gov.ie/en/Publications/Publication-files/North-East-Regional-Enterprise-Plan-to-2020.pdf
South-East	South-East Regional Enterprise Plan https://enterprise.gov.ie/en/Publications/South-East-Regional-Enterprise-Plan-to-2020.html
South-East BAU region 4	South East Business Area Unit (BAU) Five Year Forest Plan 2021-2025 http://www.coillte.ie/media/2021/02/B4-South-East-BAU-Forest-Plan-DRAFT-2021-2025.pdf

SouthWest Munster BAU region 6	South West Munster Business Area Unit (BAU) Five Year Forest Plan 2021 - 2025 http://www.coillte.ie/media/2021/02/B6-South-West-Munster-Forest-Plan-DRAFT-2021_2025.pdf
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Abruzzo	Project for the Regional Strategy of Sustainable Development Regional strategy for innovation and Smart Specialisation 2014-2020 - S3 https://www.agenziacoesione.gov.it/wp-content/uploads/2019/06/S3_Abruzzo.pdf
Basilicata	Lucano bioeconomy cluster https://www.clusterlucanobioeconomia.org/wp-content/uploads/2019/04/CLB-ETS-Vision-document-Logo.pdf Regional strategy for innovation and Smart Specialisation 2014-2020 - S3 http://europa.basilicata.it/fesr/wp-content/uploads/2018/06/Strategia-regionale-per-innovazione-e-la-specializzazione-intelligente.pdf
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Campania	Regional strategy for innovation and Smart Specialisation 2014-2020 - S3 https://www.agenziacoesione.gov.it/wp-content/uploads/2019/06/S3_Campania.pdf
Emilia-Romagna	Regional Labour and Climate Pact https://www.regione.emilia-romagna.it/pattolavoroeclima/link-al-documento-in-inglese Regional Strategy for Sustainable Development of Emilia Romagna
Friuli-Venezia Giulia	FVG – Agri-food and Bioeconomy cluster agency Regional strategy for innovation and Smart Specialisation 2014-2020 - S3 https://www.agenziacoesione.gov.it/wp-content/uploads/2019/06/S3_Friuli_Venezia_Giulia.pdf Regional Strategy for Sustainable Development of Friuli-Venezia Giulia https://agenda2030.fvg.it/rapporto-di-posizionamento-fvg-agenda-2030/
Lazio	Regional Strategy for Sustainable Development of Lazio - Lazio sustainable and participating https://www.inu.it/wp-content/uploads/regione-lazio-strategia-sostenibile-web.pdf
Liguria	Regional Strategy for Sustainable Development of Liguria https://www.regione.liguria.it/component/publiccompetitions/document/40297.html?view=document&id=40297:strategia-regionale-per-lo-sviluppo-sostenibile&Itemid=2533
Lombardia	Regional Strategy for Sustainable Development of Lombardy https://www.svilupposostenibile.regione.lombardia.it/it/attachments/file/view?hash=03faeeedf4db2ef35dbee7e268133ac4&canCache=0
Marche	Regional Strategy for Sustainable Development of Marche https://www.regione.marche.it/portals/0/Sviluppo_Sostenibile/Documenti/DGR_250_8-3-2021_All_A.pdf
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Piemonte	Regional Strategy for Sustainable Development of Piedmont https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwIjkdukkMXzAhV7_rsIHe81D-UQFn0ECAYQAQ&url=https%3A%2F%2Fwww.regione.piemonte.it%2Fweb%2Fsites%2Fdefault%2Ffiles%2Fmedia%2Fdocumenti%2F2021-06%2Ffla_strategia_regionale_impag_03bassa.pdf&usq=AOvVaw0Rv6ODmEQNtshlJbv8Fu6U Bioeconomy Technological Platform https://www.regione.piemonte.it/web/temi/fondi-progetti-europei/fondo-europeo-sviluppo-regionale-fesr/ricerca-sviluppo-tecnologico-innovazione/piattaforma-tecnologica-bioeconomia
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Provincia Autonoma di Trento	Provincial Strategy for Sustainable Development https://agenda2030.provincia.tn.it/content/download/8203/151742/version/1/file/SproSS+def_15.10.2021.pdf
Puglia	MaBiP - Manifesto for bioeconomy in Puglia https://partecipazione.regione.puglia.it/uploads/decidim/attachment/file/1561/4.La_Proposta.pdf Project for the Regional Strategy of Sustainable Development
Sardegna	Green Sardinia http://www.sardegna.riicerca.it/index.php?xsl=558&tipodoc=3&s=13&v=9&c=4200&c1=4200&id=83436&va= Regional Strategy for Sustainable Development of Sardinia https://www.regione.sardegna.it/j/v/2568?s=419943&v=2&c=94640&t=7
Sicily	Bio-Goal - from areas with high environmental risk to circular bioeconomy to build regional strategies from sustainable development goals Regional strategy for innovation and Smart Specialisation 2014-2020 - S3 https://www.agenziacoesione.gov.it/wp-content/uploads/2019/06/S3_Sicilia.pdf Regional Strategy for Sustainable Development of Sicily
Toscana	Regional Strategy for Sustainable Development Tuscany https://www.regione.toscana.it/documents/10180/25834939/ALLA_documento+di+strategia.pdf/ec0fd922-067f-4132-b451-760912049735?t=1614585655469
Umbria	Regional strategy for innovation and Smart Specialisation 2014-2020 - S3 https://www.agenziacoesione.gov.it/wp-content/uploads/2019/06/S3_Umbria.pdf Regional Strategy for Sustainable Development of Umbria
Valle d'Aosta/Vallée d'Aoste	Regional strategy for innovation and Smart Specialisation 2014-2020 - S3 https://www.agenziacoesione.gov.it/wp-content/uploads/2019/06/S3_Valledaosta.pdf

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Zeeland	Economic plan 2017-2021 https://www.zeeland.nl/economie/economische-agenda https://www.zeeland.nl/economie/circular-biobased-economy
ZUID-NEDERLAND	Innovate and achieve with impact - RIS 3 Strategy for South Netherlands 2021-2027 https://www.stimulus.nl/wp-content/uploads/2020/04/RIS3-Zuid-Nederland-2021-2027-21-april-2020.pdf
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Algarve	Regional Agenda for the Circular Economy of the Algarve region https://www.ccdr-alg.pt/site/info/economia-circular
Área Metropolitana de Lisboa	Regional Agenda 2.0 for the Circular Economy in the RLVT http://www.ccdr-lvt.pt/pt/agenda-regional-20-para-a-economia-circular-na-rlvt/10340.htm
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Centru	Smart Specialization Strategy 2021-2027 - RDA Centre http://www.adrcentru.ro/wp-content/uploads/2021/01/RIS3Centru_2021-2027.pdf
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Sud-Est	Regional Smart Specialization Strategy 2021-2027 South-East region https://www.adrse.ro/Documente/Planificare/RIS3/SRSI_SE_2021-2027_eng.pdf
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