BIO CIRCULAR CITIES

Exploring the circular bioeconomy potential in cities

Policy framework on circular bioeconomy and biowaste management

Summary

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Exploring the circular bioeconomy potential in cities

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INTRODUCTION

One of the objectives of the Biocircularcities project is to provide policy recommendations for implementing a circular bioeconomy in the three pilot territories. For that, it is important to be aware of the current policy framework regarding circular bioeconomy and biowaste management. Thus, the project partners conducted an extensive analysis of policy documents, associated to a review of good practices. The result of this work has been compiled in a document entitled "Policy framework and Good Practices on circular bioeconomy and biowaste management", available on the Biocircularcities website. The current summary provides an overview and main conclusions of the analysis of the policy framework. 122 documents about circular bioeconomy have been analysed, published between 1986 and 2022 and linked to the three pilot areas - Metropolitan Area of Barcelona (MAB), the Metropolitan City of Naples (MCN), Pazardzhik Province (PP) - at local, regional, national, and European level.

Figure 1 Geographical scope of the documents analysed

After collection, the documents were sorted by area, year of publication, type of document and classified according to nine types of waste (biowaste, by-products, food waste, forestry waste, industrial organic waste, municipal waste, plastic and packaging, sewage sludge and documents more general that include several type of waste), seven sectors (waste, circular economy, separate collection, landfill, administrative issues....), 13 topics (bioeconomy, waste prevention, public fundings, reporting...) and 21 subtopics (biowaste, separate collection, food waste, end of waste...).

In general, most of the documents analysed have been published at national level. The local administrations are producing less documents, as it can be expected that they adapt the upper existing regulations. Regarding the difference in number of documents published between the pilot territories, Catalonia is the most active of the three regions studied with more documents promoting regulation and plans regarding environment and particularly waste management than the others. The Bulgarian circular bioeconomy policy framework can be considered younger than that of the other pilot areas, explaining why less documents have been produced.

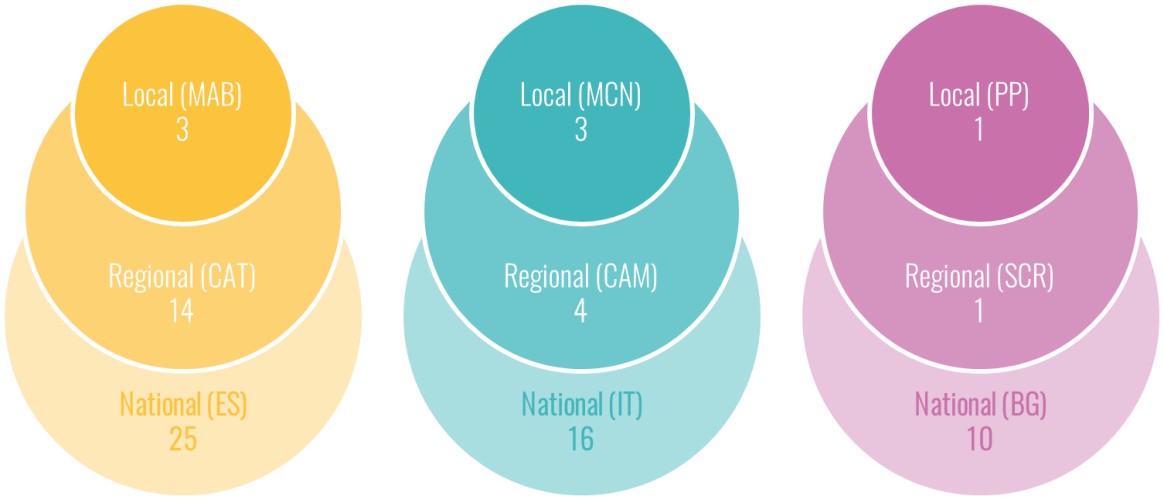

Figure 2 Circular bioeconomy documents produced by area of the pilots

Most of the documents analysed are binding, through Directives or Regulations at EU level, which shows that there is not only a wide framework on waste management, circular economy and other environmental issues, but also the commitment through compulsory documents to achieve the goals in the different topics.

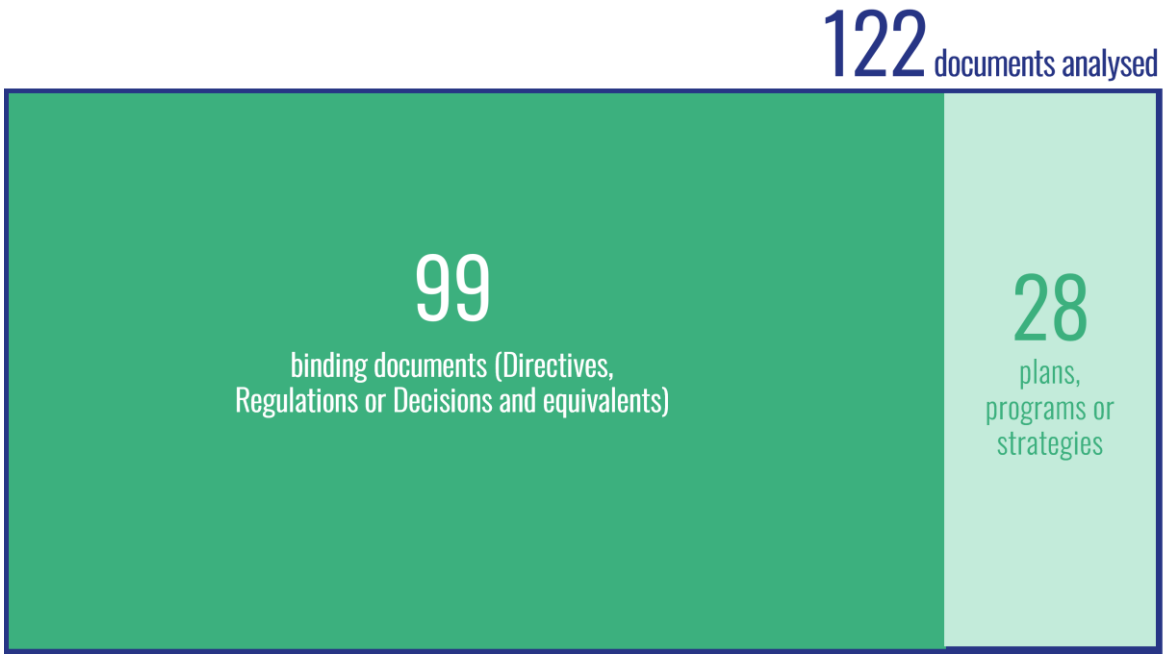

Figure 3 Number of documents analysed according to their type

EUROPEAN CIRCULAR BIOECONOMY POLICY FRAMEWORK

- **Number of documents analysed**: 45 (16 Decisions, 13 Directives, 7 Regulations, 7 Communications and 2 BAT reference documents)
- **Oldest documents:** Directives of use of sewage sludge in agriculture (1986), landfill (1999), and packaging (1994)
- **Main types of waste:** several waste (31), plastic and packaging (5), industrial organic waste (4).
- **Main sectors:** waste management (24), Administration issues (8), circular economy and agriculture and products (4 each)
- **Main topics:** environmental protection (16), treatment of waste (12), Reporting (4) and Circular Economy (3 registers)

The earliest documents analysed, published in the 2000's, concern lists of waste, animal by-products, emissions, environment protection, renewable energies. In the 2010's, more documents are published, as a result of the implementation of measures to achieve the goals of Directive 2008/98 on waste concerning aspects such as circular economy, and the content changes to include fertilisers, plastics and calculation methods of recycling ratios. During the last period, modifications of regulations on waste, landfill and packaging and animal by-products have been observed.

Table 1 Main circular bioeconomy regulations and plans, programmes, and strategies at EU level

Area	Title
Plans and programs on Circular Economy	COM (2015) 614 final. Communication from the Commission to the European Parliament, the Council, the European economic and Social Committee of the Regions — Closing the loop — An EU action plan for the circular economy COM/2018/673 final. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A sustainable Bioeconomy for Europe: Strengthening the connection between economy, society and the environment COM/2019/640 final. Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. The European Green Deal COM2020/98/final Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A new Circular Economy Action Plan for a cleaner and more competitive Europe Regulation (EU) 2021/783 of the European Parliament and of the Council of 29 April 2021 establishing a Program for the Environment and Climate Action (LIFE), and repealing Regulation (EU) No 1293/2013
Framework on waste	Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives Directive (EU) 2018/851 of the European Parliament and of the Council of 30 May 2018 amending Directive

	2008/98/EC on waste
Landfill	Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste Directive (EU) 2018/850 of the European Parliament and of the Council of 30 May 2018 amending Directive 1999/31/EC on the landfill of waste
Emissions	Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control)
Plastic and packaging	Directive (EU) 2015/720 of the European Parliament and of the Council of 29 April 2015 amending Directive 94/62/EC as regards reducing the consumption of lightweight plastic carrier bags Directive (EU) 2018/852 of the European Parliament and of the Council of 30 May 2018 amending Directive 94/62/EC on packaging and packaging waste Directive (EU) 2019/904 of the European Parliament and of the Council of 5 June 2019 on the reduction of the impact of certain plastic products on the environment
Fertilisers	Regulation (EU) 2019/1009 of the European Parliament and of the Council of 5 June 2019 laying down rules on the making available on the market of EU fertilising products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/200

Waste management

Directive 2008/98 lays down the European framework for waste management, including biowaste, according to the waste hierarchy[1]. It sets the goals for preparing for re-use and recycling of municipal waste (as well as biowaste) for the next periods. Regarding recycling, the modifying Directive 2018/851 sets the value of recycling at 65% in weight basis by 2035. It must be noticed that the values proposed refer to the recycling rate and not to the separate collection rate. The Commission Decision 2011/753, the Commission Decision 2019/1004 and the Guidance on municipal waste data collection (2016) provided by the European Commission define the proper way to calculate the recycling percentages.

The end-of-waste criteria, which is also defined in general terms in article 6 of the Directive 2008/98 and modified by Directive 2018/851, and already defined in section **Error! Reference source not found.**, is of interest to the Biocircularcities project because according to its aims, these criteria should apply to the materials produced from biowaste valorisation. These criteria would contribute to achieving higher levels of environmental protection and economic benefits and encourage recycling by reducing the administrative burden for private companies and local administrations.

Circular economy and related plans

The EU aims for the transition to a circular economy to make Europe cleaner and more competitive. And to achieve this, since the first circular economy action plan (2015 – 2019), the EU has worked through different strategies based on plans and programs rather than laws, which are represented by the waste framework directive and other directives related to waste, plastics, eco-design, fertilisers and water reuse. Plans, programs

[1] https://ec.europa.eu/environment/topics/waste-and-recycling/waste-framework-directive_en

and strategies apart from circular economy include documents based on sustainability, zero pollution or critical raw materials, as well as the Green Deal (in 2019).

There are also other programmes to promote circular economy such as the Program LIFE, deployed under Regulation (EU) 2021/783 establishing a programme for the environment and climate action (LIFE).

Plastic and packaging

The EU has produced several regulations regarding the reduction of plastic from fossil fuels (single-use plastic, packaging, etc). At first sight, there is no connection between these rules and the circular bioeconomy, but it affects it in two ways. First, the reduction in the packaging promoted by the European Commission should produce a reduction of plastic waste in biowaste. More specifically this can be seen in Regulation (EU) 2019/1009 about the marketing of fertilising products, which limits the plastic presence in digestate and compost above 2 mm to 2,5g/kg dry matter. Second, the reduction of plastic production can promote indirectly the production of bioplastic from biowaste used as a raw material for this valorisation process.

Concerning this issue, the EU is working on a policy framework on bio-based, biodegradable and compostable plastics[2] in which these products can offer a more sustainable alternative to fossil-based and non-biodegradable plastics. Currently, only Directive (UE) 2019/904 (single-use plastic) and Directive (UE) 2015/720 (reduction of plastic bags) aim at a real limitation in plastic use.

Other measures

Regarding other documents, Directive 2010/75 promotes the environmental protection by the reduction of emissions through the application of the Best Available Techniques[3] for the benefit of citizens' health and the environment, and addresses efficient energy use, waste prevention and management and measures to prevent accidents and limit their consequences.

Council Directive 1999/31 and Directive 2018/850 about landfill and the limitation of landfilling biodegradable waste are also relevant since they contribute to improving the separate collection of biowaste in order to achieve the targets of the waste framework Directive and the reduction of biodegradable waste in landfills. In fact, the admission of biowaste from separate collection in landfills is already prohibited and for 2035 only 10% of total MSW will be accepted into landfills. In parallel, Decision 2019/1004 indicates that from 2027 only biowaste from separate collection will account for the calculation of the recycling percentage. This means that the biostabilized material generated from mechanical and biological treatment will not be counted as "recycled material".

[2] https://ec.europa.eu/environment/topics/plastics/bio-based-biodegradable-and-compostable-plastics_en

[3] https://eippcb.jrc.ec.europa.eu/reference/

BULGARIAN CIRCULAR BIOECONOMY POLICY FRAMEWORK

- **Number of documents analysed:** 12 (2 not binding) – 10 national level and 1 from local and regional level
- **Main types of waste:** several waste (10), biowaste and sewage sludge (2)
- **Main topic:** environmental protection (8)

Out of the 12 documents analysed, only two are relevant when it comes to circular bioeconomy and biowaste management as they are the only ones referring to waste management and to separate collection of biowaste. These are the National Management Plan, which establishes the framework for waste management, and the national Regulation PMS20/25.01.2017 for Separate Collection of Biowaste and Treatment of Biodegradable Waste. Otherwise, nearly all the rest of the Bulgarian documents corresponds to the transposition of European rules on landfill, environment protection or sewage sludge. Most of the documents have been produced in the 2010's, similarly to the European context.

Table 2 Main circular bioeconomy regulations and plans, programmes, and strategies at Bulgarian level

Area	Title
Plans and programs on Circular Economy	National Waste Management Plan 2021-2028
Separate collection	Regulation PMS20/25.01.2017 for Separate Collection of Biowaste and Treatment of Biodegradable Waste

The main strategic goal of the **National Waste Management Plan 2021-2028** is improving the application of the hierarchy in the management of waste from society and business sector according with Directive 2008/98, by reducing the harmful effects of waste and preventing its generation and encouraging its reuse; increasing the amount of recycled and recovered waste and reducing the quantities and the risk of landfilled municipal waste.

Regulation PMS20/25.01.2017 for separate collection of biowaste determines aspects related to the separate collection of biowaste and other biodegradable waste suitable for valorisation, the end-of-waste criteria for biowaste and products of biological treatment, and quality requirements for the compost and its use.

ITALIAN CIRCULAR BIOECONOMY POLICY FRAMEWORK

- **Number of documents analysed:** 23 – 16 at national level, 4 at regional level, 3 at local level
- **Main types of waste:** several waste streams (11 – national level), municipal waste (4 – regional and local level)
- **Main sectors:** waste management; administration issues (planification and taxation)
- **Main topics:** environmental protection (10 – national level, 2 – regional level); circular economy (2)

No Italian documents currently in force have been published before the year 2000 with a prolific period in the 2010's. Earlier documents are mainly related to waste management and environment protection, while later concepts as circular economy and plastics and packaging are introduced.

Table 3 Main circular bioeconomy regulations and plans, programmes, and strategies at Italian level

Area	Title
Environment protection	National Legislative Decree 152/2006 "Norms Concerning the Environment", commonly called "Single Environmental Text" Deliberation n. 105/2021. Guidelines of waste classification
	Regional Regional Law 14/2016. "Norms concerning actuation of the European and national law on wastes" Regional Law 4/2008 "Norms concerning the management, transformation and reuse of waste"
Circular Economy	National Towards a Model of Circular Economy for Italy Overview and Strategic Framework
Plastic and packaging	National LEGISLATIVE DECREE 3 September 2020, n. 116 Implementation of directive (EU) 2018/851 amending directive 2008/98 / EC on waste and implementation of directive (EU) 2018/852 amending directive 1994/62 / EC on packaging and packaging waste. Decree n. 261, 23/6/2021 - Approval of general programme of prevention and management of packaging and waste related packaging 2019-2023
Waste management	National Deliberation n. 105/2021. Guidelines of waste classification

SPANISH CIRCULAR BIOECONOMY POLICY FRAMEWORK

- **Number of documents analysed:** 42 – 25 at national level, 14 at regional level, 3 at local level (11 plans and strategies on waste management and circular economy; 31 legal acts on various topics)
- **Main types of waste:** several waste streams (national level), municipal waste (local level)
- **Main sectors:** waste management (11 – national level); administration issues – taxation, subsidies or reporting (7 – national and regional level, 3 – local level)
- **Main topics:** environmental protection (11 – national level, 5 – regional level); treatment of waste (5 – national level) circular economy (4 – national level); public funding (2 – regional level); waste treatment (2 – regional level); waste management (3 – local level)

The two regulations currently in force, published before the year 2000, are related to fertilisers (more specifically sewage sludge) and plastic and packaging. In the 2000's, 8 documents were published focusing on environment protection and waste management. This number increased in the 2010's and circular economy became the main topic. Most recently, in April 2022, the new national law on waste has been published.

There are several environmental regulations in Spain, and particularly in Catalonia, which were published early compared to the other territories. Following the former regulation on waste at European level (Council Directive 75/442/EEC of 15 July 1975 on waste), Catalonia published the Law 6/1993 on waste before the publication of the national one in 1998 (Law 10/1998, on waste). This was accompanied by innovative policies of taxation and other economic tools that promoted the improvement of the waste management system. Since the first regional regulation, Catalonia made significant progresses to achieve certain standards of quality of biowaste separate collection, and to promote composting or anaerobic digestion facilities rather than mechanical treatment plants for mixed municipal waste.

Table 4 Main circular bioeconomy regulations and plans, programmes, and strategies at Spanish level

Area	Title
Plans and Programs	**National**
	National Framework on Waste Management (PEMAR) 2016-2022
	Action Plan on circular Economy PAEC 2021-2023
	Spanish Strategy on Circular Economy. España Circular 2030
	Spanish Strategy on Bioeconomy. Horizon 2030

	Regional Catalan Strategy on Bioeconomy 2021-2030[4] Program of public procurement of innovation (2017) Sectorial Plan of Infrastructures for the Management of Municipal Waste of Catalonia (PINFRECAT20) Program of Prevention and Management of Waste and Resources of Catalonia (PRECAT20) Agreement GOV/73/2015, on approval of the Strategy to boost green economy and circular economy Catalan strategy of ecodesign for circular and ecoinnovative economy
	Local PREMET25. Metropolitan Program on Prevention and Use of Resources and Municipal Waste 2019-2025
Waste	**National** Law 7/2022, on waste and polluted soils for a circular economy
	Regional Law 8/2008, on the financing of waste management infrastructures and taxes on disposal of waste refuse Legislative Decree 1/2009, on passing of recast text of Law on waste Decree 152/2017, on classification, coding, and management of waste in Catalonia Law 3/2020, on the prevention of food losses and food waste
	Local Metropolitan Agreement for Zero Waste Exp 9000350/19
Financial	**National** - no documents at national level -
	Regional Law 8/2008, on the financing of waste management infrastructures and taxes on disposal of waste refuse Law 5/2020, on fiscal, financial, administrative and public sector measures and the creation of the tax on facilities that affect the environment
	Local Fiscal regulatory ordinance 2021/904671 of metropolitan taxes on treatment and disposal of municipal waste
Fertilisers	**National** Royal Decree 506/2013, on fertilising products
	Regional Legislative Royal Decree 1/2016, on passing of recast text of the Law of integrated pollution prevention and control
Environment protection	**National** Law 26/2007, on environmental responsibility

[4] ACORD GOV/141/2021, de 14 de setembre, pel qual s'aprova l'Estratègia de la Bioeconomia de Catalunya 2021-2030. Departament d'Acció Climàtica, Alimentació i Agenda Rural. Generalitat de Catalunya

Plans and programs

Plans and programs published at national level tackle circular economy and waste management. Usually, they are accompanied by a legal act for the passing of the Program through the corresponding body (Parliament, Government, etc.). The Spanish Strategy on Circular Economy is aligned with the EU plans and its main objectives address waste reduction, food waste, water and pollutant emissions and preparation for re-use. Economy policies, taxation, sustainable consumption or rural development are among the key issues promoted to achieve a circular economy. A National Action Plan in Circular Economy, developed in accordance with the EU's Circular Economy Action Plan, sets 5 topics (production, consumption, waste, raw materials, water) and 3 lines of action (research, participation, employment).

Plans and programs at regional and local level are also related to waste such as the Catalan Strategy on Bioeconomy 2021-2030 and the Metropolitan Program on Prevention and Use of Resources and Municipal Waste 2019-2025 (PREMET25).

Waste management

An early deployment of regulation on waste in the Catalonia region set out the foundations of further regulations. Currently, the regional administration is preparing a new regulation to repeal Legislative Decree 1/2009, but this process still is at a very early stage.

There are also regulations at local level through bylaws which are mainly focused on waste and the circular economy. Regarding waste, these bylaws define conditions for separate collection of municipal waste and regulate the charges levied to finance the service, including possible incentives for participating in separate collection. Some local administrations can incentivise companies through reductions in waste charges, in case they have circular economy plans or they adopt a series of good practices.

Taxation

Another important piece of regulation in the Catalan framework is the Law 8/2008, on the financing of waste management infrastructures and taxes on disposal of waste refuse. This law repeals the original one from 2003, when the tax was created. The tax rate for the landfill tax was 10 €/t in 2004 when it was implemented. In 2009 it was extended to waste incineration (5 €/t). These tax rates have been increased steadily. As of 2022, the tax rates are 59.10 and 29.60 €/t, respectively, for disposal in landfills and for incineration. These should continue to increase until 2024 to achieve, respectively, 71,60 and 35,80 €/t. This measure has encouraged separate collection, to avoid the payments, and, on the other hand, the funds collected from these taxes have also contributed to improve separate collection. In 2020, the Catalan Government collected from this tax 68,548,887€ from disposal and 13,591,701€ from incineration. On average 96% of this revenue is annually channelled back to Local Authorities according to their separate collection results and types of treatment. In 2020, this revenue was allocated to the treatment of the municipal biowaste (72%) and to the improvement of separate collection (26,6%), while a small part (1,4%) was kept as remaining. The total funds collected since 2011 have been above 600 million euros, used to improve the waste management system.

A new landfill and incineration tax was created at national level by Law 7/2022. It is still unclear how the new national system will impact the pre-existing regional taxes implemented in Catalonia.

Fertilisers

Regulations regarding fertilisers in Spain, once it become part of the EU (1986), have their origin in the Royal Decree 72/1988. Later, other documents in 1998, 2005 and the current Royal Decree 506/2013, on fertilising products have regulated the sector. Initially, the regulations were addressed to chemical fertilisers, and it was in 2005 when a stronger commitment with organic amendments and the use of waste as resources to produce them started. In the current regulation, biowaste from municipal origin is considered as an ingredient for biological treatment and for the production of growing media according to Royal Decree 865/2010. Regarding the digestate, it can be used as an ingredient for a biological process, but it is not considered as a fertiliser itself under the precepts of the RD 506/2013. Nevertheless, considering its use in agriculture, it should fulfil other requirements as hygienisation according to other acts, as Regulation 1009/2019 or Regulation 1069/2009 and according to use as waste recovery operation R10.

COMPARATIVE ANALYSIS

By type of waste

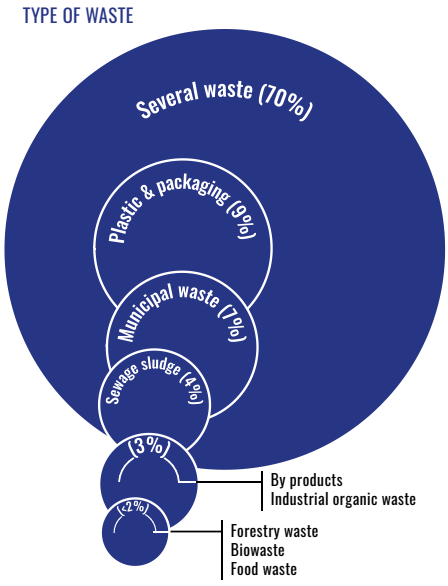

Figure 4 Representation of type of waste in the collected documents (EU, ES, IT and BG)

Most of the documents analysed refer to general aspects of waste and to several types of waste. Documents focusing on a unique type of waste are the minority, such as the Directive 1999/31 that is centred on sewage sludge. In fact, 70% of the documents (85 out of 122 documents) are addressing *several waste* fractions, and refer to regulations on waste management, waste categorization or statistics. The documents related to specific waste include plastic and packaging (11) and municipal waste (9), which apply at national, regional, and local level but not at European level. The remaining categories include sewage sludge (5), industrial organic waste (4), by-products (4), forestry waste (2), food waste (1) and biowaste (1). Municipal waste management, as collection, treatment and costs, is commonly under the responsibility of the local administrations, and therefore its presence is limited within the collected documents at European level. Whereas major relevant aspects are regulated by upper levels.. Forestry waste is important in Bulgaria, considering the nature of the territory, mainly constituted by forested areas (56%) and agricultural lands (36). Most of the documents that only refer to food waste are published in Catalonia, and one document in Bulgaria refers to biowaste exclusively (Regulation

PMS20, of 25.01.2017 for Separate Collection of Biowaste and Treatment of Biodegradable Waste), although biowaste source separation is not yet implemented in the territory. In the case of Italy, the main type of waste in the documents refer to municipal waste, while the rest of documents refer to waste in a more general way without specifying the type of waste.

By sector

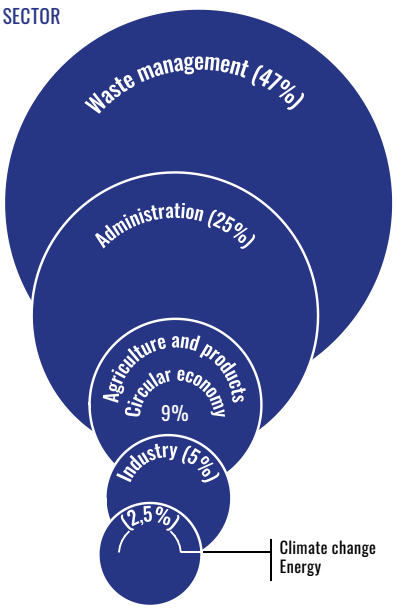

Figure 5 Representation of sectors in the collected documents (EU, ES, IT and BG)

The Waste Management sector is the most represented (57) followed by rules related to the Administration (31), such as subsidies, taxation or reporting, where in both cases most of the documents are binding (51 and 28, respectively). Other aspects as Energy (3) or Industry (6) presented lower relevant documents for the projects. With regards to Circular Economy, a total of 11 documents were identified and they correspond to programs, plans or strategies.

The main sectors represented by the collected documents are Waste Management (57) and Administration (31). The main issues in each of these two categories are, respectively, Environment protection (21), Treatment of Waste (21), Reporting (8) and Public Fundings (4) (**Error! Reference source not found.**). "Agriculture and products" sector includes documents related to land use as fertilisers or sewage sludge.

Most of documents addressing Waste Management were produced at European level (24), while those related to the administration are more represented at regional and local level.

By topics

Most of the collected documents refer to **environmental protection** (53) or **waste management in general terms** without focusing on one specific waste topic. It means that they present the wider concept of waste and can cover the different types of biowaste (agriculture organic waste, biowaste, food waste, forestry residues, green waste, or industrial organic waste). For example, Directive 2008/98 on waste (and subsequent amendments) addresses separate collection, different kind of waste, classification of waste, programs, etc. On the opposite, Regulation 1069/2009 about animal by-products is more specific. 4 documents were specifically related to industrial organic waste and only 1 to food waste, a Catalan law of 2020 regarding prevention of food waste.

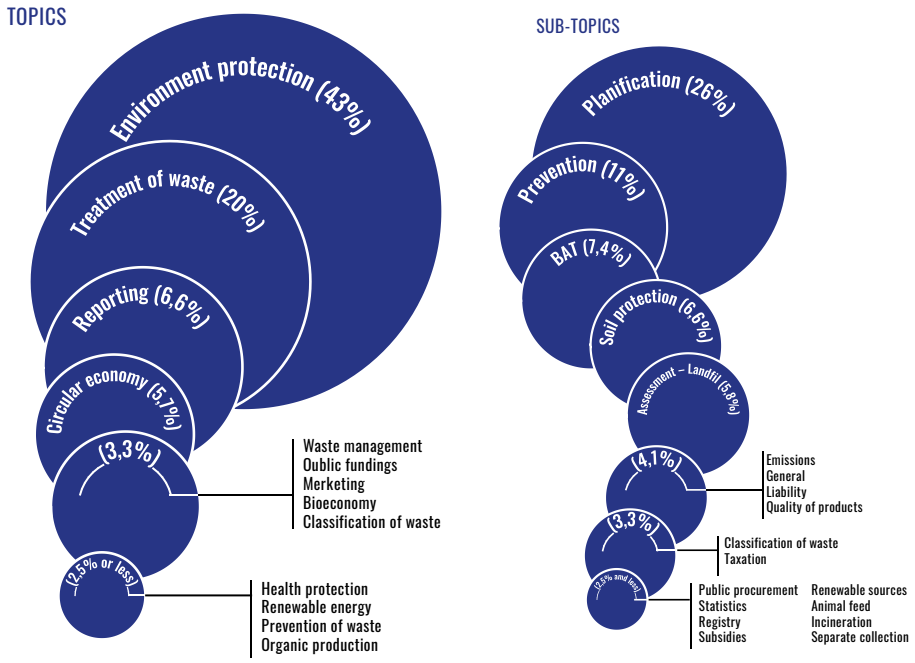

Figure 6 Representation of topics and sub-topics in the collected documents (EU, ES, IT and BG)

Waste treatment is the second most identified topic with 24 documents analysed, the other 11 topics reported less than 10 each, with an average of four documents each. For example, the two next topics are **Circular Economy** and **Reporting to administration**, with 12 and 8 documents respectively. Recently, several regulations regarding plastic and packaging have been produced, highlighting the increasing importance of these topics. For instance, the rising concern about plastics in the environment led to a specific regulation on single-use plastic, which led to an increasing interest in bio-based alternatives to fossil-based plastics. Regarding the Circular Economy, different programs have been launched in the last decade with deadlines for 2030. As an example, in the European context in 2020 the new Circular Economy Action Plan (COM/2020/98 final Circular Economy Action Plan-CEAP) through which the EC encourages the Member States to adopt the recommendations to achieve a circular economy implementation was launched. It could be expected that, as a consequence, legal binding acts would be enacted by the different Member States to fulfil the circular economy aims.

Reporting, **marketing** or **public fundings** are topics addressed by a lower number of documents. **Health protection**, **renewable energy** or **organic production** are the topics less represented in the analysed documents. Although none of the documents explicitly refers to biowaste management, the concept is included in the content of several rules among other questions. This can suggest that more specific weight should be given to the importance of biowaste in the context of circular bioeconomy.

Regarding the subtopics, Planification seems to be the tool to achieve the goals proposed; because of this, up to 31 documents are published, at least one document in each of the pilot area. Documents about Prevention (12) are mainly focused on avoiding plastic waste and its environmental impacts and are produced at different levels. The 19 remaining sub-topics present less than 10 documents, with an average of four.

By period

A significant increase in the publication of documents is observed after the Waste Framework Directive in 2008 (**Error! Reference source not found.**). The Directive 2008/98 repealed Directive 2006/12/CE after a short time because it was considered necessary to clarify concepts in the interests of clarity and readability. This included the improvement of the definition of waste, prevention, and life cycle of products among others. Even though, it is worth highlighting that the directive of 2006 replaced a directive on waste that was in force since 1975. Fortunately, after this time, not only general rules on waste have changed but also other related subjects as emissions, formalities and landfill have been updated.

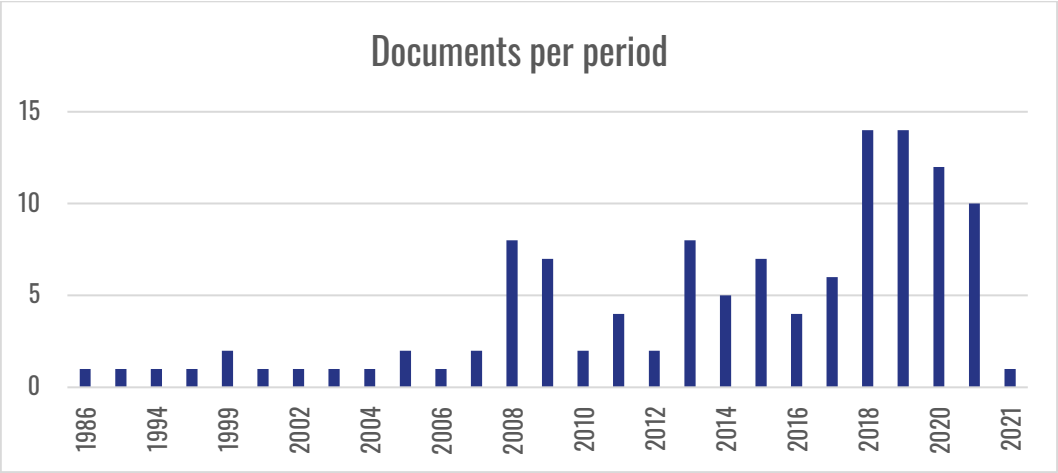

Figure 7 Documents per year for all data

In 2018 there is another important variation in the number of published documents, mainly caused by the publication of plans and programs about the circular economy at European and national level and to the revision of all Directives related to waste management. Key targets have to be reached by 2020, 2025, and 2030.

The existence of environmental laws dating from more than 30 years, as Directive 86/278 on sewage sludge, highlights the need for a revision. In the case of the rules on sludge, the last attempt of modification was in 2000 with the 3rd draft of the Working document on sludge (EC, 2000), but few substantial modifications have been introduced, and none of them affects the limits of heavy metals for use of sewage sludge in agriculture.

CONCLUSION

The publication of the Waste Framework Directive in 2008 led to the publication of many plans and local regulations. This highlights the key role of the EU legislation to initiate actions towards the implementation of regulations and plans at local level, and particularly about the circular economy.

Issues tackled in the collected documents, and particularly regarding legal acts, are dealt with wide scope, that means that they refer to several type of waste and to general aspects such as waste management or environment protection. On the other side, few documents refer to specific waste such as sewage sludge or animal by-products or to specific topics such as classification of waste or marketing of products. The analysis conducted indicates that, for example, as regards to new technologies such as obtention of bioproducts, there is still an empty space showing the relevance of projects like Biocircularcities that can help to produce useful policies.

Several documents refer to separate collection, but concrete measures to be applied can only be found in lower administrative levels, such as the obligation to the citizens to separate waste. Whereas European regulation tends to give guidelines to be implemented by Member States, more precisions at national level on how to improve the participation of waste producers would help to achieve the goals. On the other hand, other regulations such those related to landfill promote separate collection of biowaste by limiting the possibilities of disposal.

IMPACT FOR THE BIOCIRCULARCITIES PROJECT

As new documents can appear with the publication of new regulations or plans, a regulatory monitoring will be performed throughout the project. This work will support an upcoming analysis of current regulatory barriers and opportunities for the recycling of bio-waste in the pilot areas, followed by policy recommendations.

The Biocircularcities project seeks for innovative valorisation of biowaste other than composting and anaerobic digestion or energetic valorisation. Nevertheless, the current legal and policy framework on biowaste recovery mostly focuses on these treatments. To foster innovative biowaste valorisation towards bio-based operations for material use, specific regulations and policies need to be introduced.

www.biocircularcities.eu