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Bioeconomy knowledge base: an online library to support EU policymaking

The European Commission's Knowledge Centre for Bioeconomy



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Abstract

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. Compiling a robust information or evidence base is an essential component of better policymaking and one of the actions of the EU Bioeconomy Strategy is to enhance information and the knowledge base on the bioeconomy, including sustainable biomass supply and demand, and forward looking, cross-sectoral assessments, and to make this information accessible through the Knowledge Centre for Bioeconomy. Data, information and knowledge related to the bioeconomy are being produced at an accelerated pace and as the amount of available knowledge increases, the more pressing becomes the need to manage this knowledge. This means that knowledge needs to be properly captured, organised, stored, and shared and disseminated.

In this context, the Knowledge Centre for Bioeconomy includes an online library that provides a one-stop shop for filtered and distilled knowledge on the bioeconomy to support evidence-informed EU policymaking. Its strength is the relevance, quality and accessibility of its resources as a result of a curation process and method that emerged from a series of gradual improvements and optimisations based on the lessons learnt over the previous years. This library is constantly updated with the latest publications, datasets, events, news, visualisations and other resources, and made publicly accessible on the Commission's Knowledge for Policy Platform (<https://knowledge4policy.ec.europa.eu/>). This report describes the workflow process and methods used in the curation task, and details how the knowledge is organised, stored and shared. It contains statistics on the resources available and take-up from the users, and some concluding reflections on the approach, with recommendations on the way forward.

Acknowledgements

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1 Introduction

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, i.e. 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.

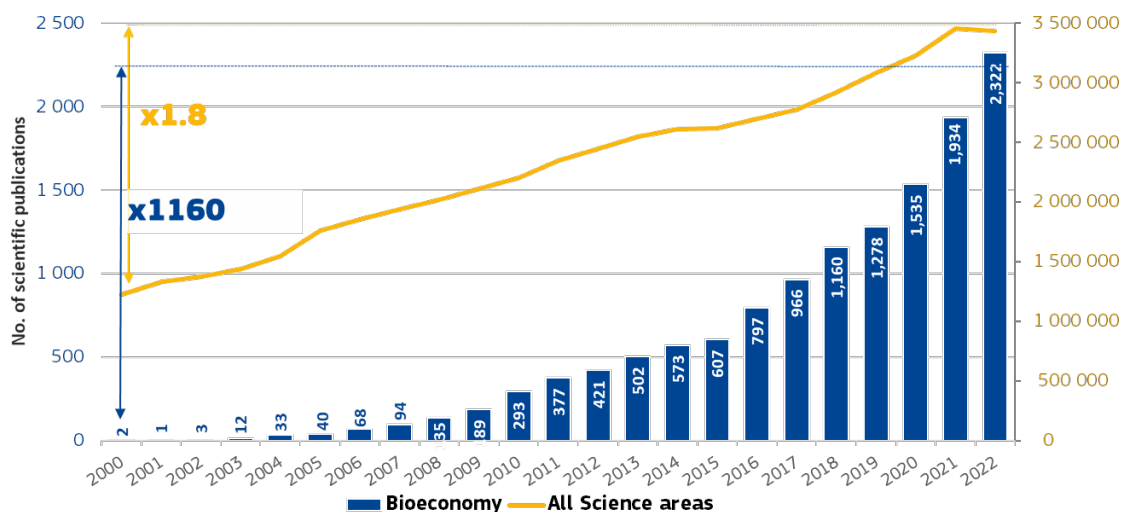
The EU Bioeconomy Strategy, updated in 2018 (European Commission, 2018), put forward an action plan to drive a sustainable and circular bioeconomy based on three key priorities:

1. Strengthen and scale up the bio-based sectors, unlock investments and markets
2. Deploy local bioeconomies rapidly across the whole of Europe
3. Understand the ecological boundaries of the bioeconomy

Under action 3.1.1 of this plan, the European Commission (EC) is committed to enhance information and the knowledge base on the bioeconomy, including sustainable biomass supply and demand, and forward looking, cross-sectoral assessments, and to make this information accessible through the Knowledge Centre for Bioeconomy.

Data, information and knowledge related to the bioeconomy are being produced from different sources including from the JRC. The pace of bioeconomy knowledge production exceeds by far the general increase in scientific knowledge production. For example, over the last two decades, the number of bioeconomy-related peer-reviewed papers published each year increased by a factor of circa 1100, compared to the increase of new peer-reviewed papers across all science areas by a factor of circa 1.8 (Figure 1).

Figure 1. Increase in the number of scientific publications on the bioeconomy and all science areas¹



Source: Own elaboration.

Compiling a robust information or evidence base is an essential component of better policymaking (European Commission, 2021). As the amount of available knowledge increases, the more pressing becomes the need to manage this knowledge in order to ensure that policymaking can be based on the best available evidence (European Commission, 2016). This means that knowledge needs to be properly captured, organised, stored, shared and disseminated. In order to address this challenge, the JRC has created Knowledge Centres in specific

¹ Search performed in Scopus. Publications on the bioeconomy have been identified based on the search function "ti_abs_key:(\"biobased industry\" OR \"bio-based industry\" OR \"biobased industries\" OR \"bio-based industries\" OR \"biorefineries\" OR \"bioeconomy\" OR \"bio-economy\" OR \"biobased economy\" OR \"bio-based economy\" OR \"biomass\" OR \"biobased\" OR \"bio-based\")"

areas where there is a clear and specific EU policy demand and where the JRC has a critical mass of knowledge on which it can build. Amongst them, the European Commission's Knowledge Centre for Bioeconomy (KCB) was launched in July 2017 to pull together and make accessible the knowledge and expertise needed to assess the status, progress and impact of the bioeconomy. The KCB built upon and integrated the Bioeconomy Observatory set up by the JRC in 2013 (Verdeyen et al., 2016).

The KCB deals with the complex and abundant knowledge and expertise available from different sources through knowledge management activities that, together, enhance the knowledge base for policymaking. One of these activities is KCB's online library that is continuously enriched to give one-stop access to curated information on bioeconomy from different sources: publications, datasets, news articles, events, glossary terms, etc.

This report describes the methodology and the process used to design and populate the KCB library with curated information, and summarises the status of the library contents, at the end of 2022.

Section 2 describes the types of knowledge resources included in the library, section 3 details the steps followed to identify and filter relevant information (3.1), organise and store knowledge (3.2), share and disseminate knowledge (3.3). Section 4 presents a quantitative analysis of resources available in the KCB library and their use, in terms of quantitative statistics on the visits and use of the web platform as well as in terms of qualitative feedback from stakeholders and external experts. Section 5 concludes with reflections from the experience in building the KCB library. It reports on (i) benefits of the approach, focusing on the reliability and consistency of the curation process, as well as the relevance and accessibility of the resources; (ii) on technical and methodological limitations and (iii) provides recommendations for further improvements

2 Types of knowledge resources

Effective knowledge management means delivering the right information to the right person at the right time. The target audience of the KCB library is primarily EU policymakers, whilst other bioeconomy stakeholders (policymakers at national and regional level, researchers, industry experts etc.) may also utilise its publicly available resources for their specific needs. The former are most interested about synthesised science-based and policy-oriented reports, latest news on a specific technology or policy files and standardised, officially-agreed terms and definitions. The latter tend to look for scientific publications to be up-to-date on a specific topic, raw data to conduct analyses or interesting scientific conferences to attend to (Sienkiewicz & Mair, 2020).

The types of knowledge resources captured in the KCB library have been specifically selected to address these different needs and to foster synergies and interaction among users, streamlining the selection of resources to the ones that might be really needed by the two types of audiences.

The table below describes the types of knowledge resources integrated in the KCB library.

Table 1. Types of knowledge resources integrated in the KCB library

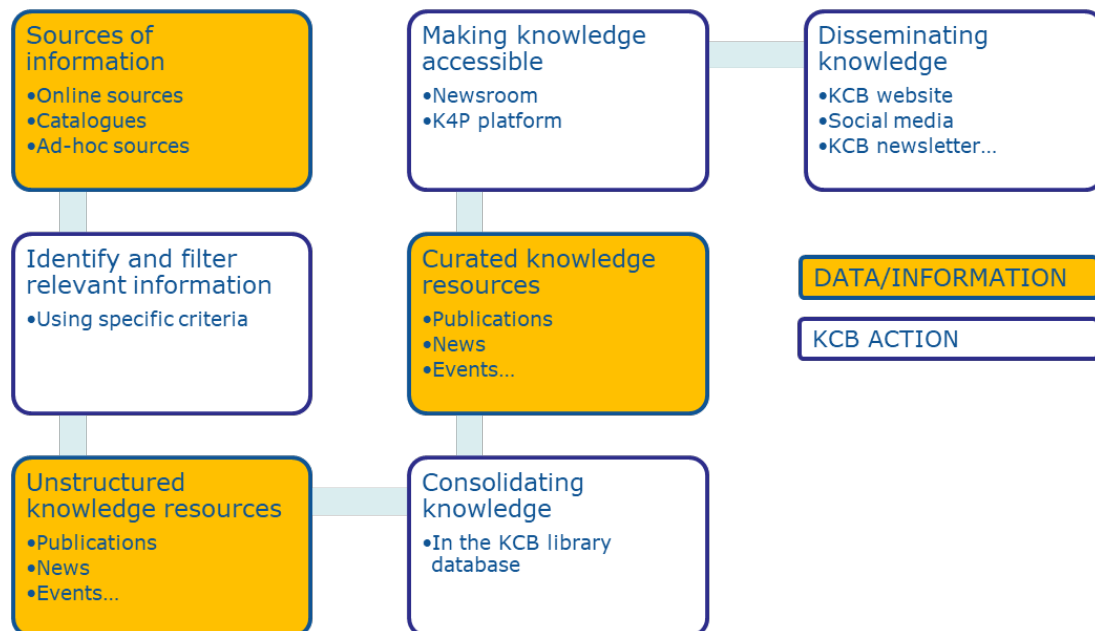
Knowledge resource	Description
Publications	a wide range of categories of documents, comprising scientific (peer-reviewed) publications, technical reports, statistical reports, science for policy reports, project (EU-funded) deliverables, policy documents, knowledge for policy briefs and audio-visual material (e.g. infographics, factsheets, videos, etc.)
News	articles with information on recent developments in the field of the bioeconomy and/or its sectors
Events	physical or online events, such as seminars, conferences and workshops
Visualisations	interactive exploratory and explanatory dashboards and infographics
Datasets	collections of (raw) data relevant for the bioeconomy
Glossary Items	definitions of terms relevant for the bioeconomy
Projects & activities	projects and activities led by the JRC and relevant for the bioeconomy
Organisations	relevant public or private institutions, linked to the knowledge resources
Online resources	other online resources relevant for the bioeconomy, such as web-based platforms, databases and data catalogues with retrievable data

Source: Own elaboration.

3 Workflow process and methods

The online library of the KCB is the outcome of an articulated multi-step curation workflow (see **Figure 2** and **Figure 8**). This workflow starts with the identification and selection of bioeconomy-related sources of information (section 3.1.1), which are monitored on a weekly basis to identify and filter relevant information following a set of selection criteria (section 3.1.2). The selected information is then categorised in a set of knowledge resources (as described in section 3.2.1), organised according to a specifically designed taxonomy and stored in a database with a predefined structure (section 3.2.2). Finally, the knowledge resources are made available through the KCB web presence on the Knowledge4Policy (K4P)² platform (section 3.3). A subset of the curated resources is further selected to be disseminated in a bi-monthly KCB newsletter (section 3.3.3). The following subsections describe each of these steps in detail.

Figure 2. Simplified KCB library workflow process



Source: Own elaboration.

² The EU Commission's platform for evidence-based policymaking (<https://knowledge4policy.ec.europa.eu>).

3.1 Identify and filter relevant information

3.1.1 Sources of information

The sources of information used to feed the KCB library include a set of online repositories with information available in the English language.

Preselected online sources

These currently comprise 156 specific online sources (see Table in Annex 1), selected according to their relevance in the bioeconomy field. They include specific websites of well-known and accredited international and national organisations, news repositories related to bio-based products and innovation, EC websites and hubs of peer-reviewed scientific publications.

The sources are listed in the Newsdesk Service of the Europe Media Monitor (EMM) tool³ and scanned continuously, according to a set of 43 keywords (“alerts” in the EMM system). In the current setting, the system assigns a weight to each alert (word weight list). The weight of an alert is the value summed when that alert is found in the text. The sum of the weights of the matched alert is compared to the threshold value to determine whether or not to trigger the item. Most of those keywords have the same weight of 50 in the search query, and the presence of one term in the scanned item is enough to trigger its selection (the weight threshold in our case is 50). Based on the quality of the information captured, the set of alerts is optimised. For example, for a few alerts a low weight was introduced to avoid the selection of items that are not relevant. The term ‘biotechnology’ and derivatives triggered items that are related to health, which is not included in the EC’s definition of bioeconomy. For this reason a weight of 25 was assigned to these terms, so that the item containing the term ‘biotechnology’ is triggered by the query only if there is at least another relevant keyword in the text, summing up to the weight threshold of 50. Similarly, with the COVID-19 pandemic, the term biotech- was triggering many news and publications related to vaccines. This was distorting the efficient selection of relevant items for the KCB library. Thus, a negative weight of -999 for the term ‘vaccine’ – and its derivatives was applied, meaning that whenever the term is in the text, that article would not be selected by the EMM filtering system.

The set of alerts is used by the EMM search to allow an automatic first level filtering of potentially relevant information to consider in the (manual) selection (see section 3.1.2). The complete list is available in Annex 2

Pubsy

PUBSY is the corporate management system for JRC outputs. Public documents are automatically disseminated through the JRC Publications Repository⁴ (available to the public domain). These documents are also imported automatically into K4P and are available to the KCB and other Knowledge Services’ (KS)⁵ for selection (see section 3.3).

The JRC Data Catalogue

The JRC Data Catalogue⁶ contains a continuously updated inventory of datasets produced by the JRC in accordance with the JRC Data Policy (Friis-Christensen & Triaille, 2019). The catalogue organises its content in dataset collections. A dataset collection is a set of metadata records about datasets that are related to each other according to some criterion. Collection of datasets are also assigned to science areas.

Ad-hoc sources

Besides all of the above sources of information, ad-hoc sources are also considered. They include exchanges with stakeholders and colleagues, presentations in events, newsletters, and social media and information occasionally retrieved on the internet.

³ EMM is a system for monitoring open source news and information, developed and maintained since 2002 by the EC Joint Research Centre (JRC). The EMM allows monitoring of a large (but selected) set of electronic media, reducing the information flow to manageable proportions by clustering related news, categorising articles and applying Language Technology tools to derive further metadata, such as recognising and disambiguating entities in the text, extracting quotes by and about people, applying sentiment/tonality analysis and more. More info at: https://knowledge4policy.ec.europa.eu/online-resource/europe-media-monitor-emm_en

⁴ <https://publications.jrc.ec.europa.eu/repository/>

⁵ “Knowledge Services” (KS) refer here to the Knowledge Centres and Competence Centres hosted in the Knowledge4Policy platform.

⁶ <https://data.jrc.ec.europa.eu/>

3.1.2 Selection of information

The extensive list of items retrieved automatically from the sources of information described in section 3.1.1, and which are potentially relevant, go through a process of further manual filtering on a weekly basis. During this step, bioeconomy experts read the information and select, as knowledge resources, the items for the KCB library (see section 2) that, according to their expert judgement, meet the following criteria:

1. are open access, freely accessible without any fee or registration needed
2. are relevant for the bioeconomy from a scientific or policy angle
3. have a clearly identified source
4. report facts (rather than an opinion) and gives evidence to support its main points
5. are written at an appropriate language level (i.e. not too elementary or advanced)
6. are written with an unbiased language or tone (incl. commercial bias) and is free of emotion

In addition to these criteria that apply to all resource types, the type of knowledge resource 'events' qualifies if the event is organised by an EU institution, or EU-funded projects, or Member States administration, or academia, or international organisations, or organised by others and include representatives of EU institutions as speakers. In case there are no representatives of EU institutions as speakers, the selection is based on relevance of the organisation and of the event to the policy debate on the bioeconomy.

The complete list of criteria for each specific knowledge resource is available in Annex 3.

3.2 Consolidating knowledge

3.2.1 Taxonomy

Taxonomies are organised lists of concepts or notation systems that are used to initially tag content and then find it through navigation or search. In other words, it is the practice of classifying and structuring content, and the use of taxonomies is crucial to manage knowledge in an efficient way.

As mentioned above, K4P serves as a common platform for the KCB and many other hosted KS, therefore a common taxonomy to classify its content is needed. On the other hand, each KS has its own needs in terms of topics, content types, etc.

For this purpose, two 'levels' of taxonomy were created in K4P and applied for the KCB library:

- a small set of global taxonomies, applied to all knowledge, used by users to filter search results when they search from the K4P home or from one of the KS pages.
- 'local taxonomies', specific to KS. Users of the platform can use them as search filters only within the specific KS website.

Global taxonomies

Global taxonomies, by definition, must be used by all KS, so a consensus was reached for the following ones:

- content type (see Section 2), specifying what sort of knowledge is being classified/categorised (e.g. publication, dataset, projects/activities, news, event, page, etc.);
- related organisations (all organisations and their description and other metadata are common within K4P);
- related project & activities (all projects are common within K4P);
- geographic coverage, which classifies the content according to the geographical coverage, being common to all KS;
- Digital EUROPA Thesaurus⁷ (DET) and K4P Global, global taxonomies describing what the content is about

The DET is a multilingual thesaurus covering the main subject matters of the EC's public communications. It has been designed to describe and index web content from across the EC so that this content can be retrieved, aggregated, and managed. The thesaurus is maintained by the Directorate General for Communication. In line with the objectives of semantic interoperability, DET reuses EuroVoc⁸ concepts in combination with a few additional non-EuroVoc concepts necessary for describing web content subject matter.

K4P Global consists of keywords, which are not in DET but are used by more than two Knowledge Services. DET and K4P Global appear as a unique list when tagging or filtering content.

By definition, a taxonomy is a controlled vocabulary in which all the terms belong to a single hierarchical structure and have parent/child or broader/narrower relationships to other terms. The structure is sometimes referred to as a 'tree'. The addition of non-preferred terms/synonyms may or may not be part of a taxonomy⁹. The DET follows this hierarchical structure. However, at the time of the present report the taxonomy used in K4P is a 'flat keyword' version of DET, but it aims to evolve towards the hierarchical structure.

An example of the global taxonomies used in the KCB platform is shown in **Table 2**.

⁷ <https://op.europa.eu/en/web/eu-vocabularies/concept-scheme/-/resource?uri=http://data.europa.eu/uxp/det>

⁸ <https://op.europa.eu/en/web/eu-vocabularies/dataset/-/resource?uri=http://publications.europa.eu/resource/dataset/eurovoc>

⁹ <https://op.europa.eu/en/web/eu-vocabularies/taxonomies>

Table 2. Global taxonomies

Content type	Geographic coverage (extract)	DET + K4P Global keywords (extract)	Related organisations (extract)
Publication	European Union	agricultural land	JRC
News	World	agriculture	EC
Dataset	Europe	aid to Agriculture	FAO
Event	Region (subnational)	alcohol	Eurostat
Glossary item	Germany	alcoholism	OECD
Online resource	Finland	analysis	IEA
Organisation	...	arable land	European Parliament
Page	
Visualisation			...
Navigation page			
Topic/tool			
Projects and activities			

Source: Own elaboration.

Local taxonomies

In order to better organise the bioeconomy-specific content, the KCB also uses a set of local taxonomies, which only appear as search filters when the user is searching from within the KCB page. These are the following:

- Bioeconomy keywords: bioeconomy-specific concepts which are not present in the global taxonomy and are used to tag the content selected for publication in the KCB library
- Bioeconomy glossary categories: the sources for the definitions of the terms included in the bioeconomy glossary¹⁰
- Bioeconomy publication format: typologies of the documents selected
- Bioeconomy topics: specific topics for which the KCB has developed knowledge syntheses in the form of webpages, with videos, briefs and other resources.

The local taxonomies and related terms currently used in the KCB platform are shown in **Table 3** (an extract) and Annex 4.

In order to classify the selected knowledge resources according to their content, the KCB uses a combination of keywords from the global taxonomies and local taxonomies. These tags are then used to filter content in a search (see also section 3.3.1 of this report). Furthermore, when content is tagged with a topic, project or an organisation, it appears in the 'Latest knowledge' section of that topic, project or organisation. For many content types there is also a 'Related Reading' section at the bottom of the page, which is triggered dynamically based on the matching of taxonomy terms. Thus the tagging of knowledge resources with a comprehensive taxonomy allows aggregating related content and helps users retrieve related content.

¹⁰ <https://knowledge4policy.ec.europa.eu/bioeconomy/glossary>

Table 3. Local taxonomies

Bioeconomy keywords (extract)	Bioeconomy glossary categories	Bioeconomy publication format	Bioeconomy Topics
algae bio-based chemicals and materials bio-based textiles biorefinery blue economy charcoal energy conversion food system food system transformation forest-based industry fossil-based ...	International organisation Scientific and technical literature EC Technical Documents Standards EC Policy documents EU legislation Agency documents Dictionaries Biomass study JRC own definition	Scientific publication JRC publication Policy document Data/statistical report Technical report Project deliverable Audio-visual material Other	Forestry biomass Algae biomass Agricultural biomass Fisheries and aquaculture biomass Policy Economy Assessing environmental impacts Forest-based bioeconomy for climate change mitigation

Source: Own elaboration.

There are numerous factors to consider for determining how many terms or how broad any taxonomy should be used by editors to classify content for the end-users. For example, very narrow or ambiguous descriptors would make it difficult for other systems to re-use the terminology to deliver this content in other platforms. Besides, very specific terms do not add real value for the user because they are rarely used by editors and possibly obscure the main subject(s) in a knowledge resource. On the other hand, with very generic keywords the content may be 'lost' in an ocean of similarly tagged content when merged with other resources and can lead to unsatisfactory search effectiveness and difficulty in managing the content. Therefore, terms must be self-explanatory (given the larger context and content) and unambiguous (not necessarily narrow) and must stand on their own. Consequently, KCB editors strive to consistently apply the same set of concepts to similar content and to avoid the scenario of very generic, overlapping or ambiguous concepts being used indiscriminately.

3.2.2 Database

The information identified from different sources (preselected online resources, PUBSY, JRC Data Catalogue and ad-hoc sources) and selected using specific criteria and organised using specific taxonomies is consolidated in the KCB library database.

The KCB library database is a tabular file, for internal use, structured in different tabs for the different kind of resources. It stores comprehensive information for the knowledge resources available in the online library, including name, link, fields according to the global and local taxonomies and additional information e.g. geographical dimension, backup links, source retrieval.

This database serves as an offline intermediate archive of the information intended for online publication, provides easy access to all the resources and allows easy extraction of statistics or information for different evaluation reports.

3.3 Sharing knowledge

The selected knowledge resources stored in the KCB database are integrated in the web presence, through the backend of the K4P platform. This is a manual task adding the relevant content with the correct content type, an abstract or short description of each item, and tagging it using the different taxonomies. It is then shared through an online library accessible through the KCB website: <https://knowledge4policy.ec.europa.eu/bioeconomy>. Published knowledge resources, where relevant for different KS hosted in the K4P platform can also be shared, thus avoiding duplications.

3.3.1 Searchable knowledge

There are different ways for accessing content on the KCB web platform (**Figure 3**):

- by browsing the 'Topic' menu
- by browsing the 'Country' menu
- by selecting from 'Featured content'
- by selecting from 'Latest news', 'Next events', 'Latest resources'
- by using keywords in a search bar

Figure 3. Ways of accessing resources

The screenshot displays the 'Search our KnowledgeBase' interface. At the top left, a yellow box highlights the text '5 ways to access'. The search bar includes a search input field and a 'Search' button. Below the search bar are radio buttons for content types: All (selected), Dataset, Event, Glossary item, News, Online Resource, Organisation, Publication, and Visualisation. The main content area is divided into several sections: 'Browse Bioeconomy by topic' with four topic cards (Agricultural biomass, Forestry biomass, Fisheries and aquaculture biomass, Algae biomass); 'Featured content' with four featured items (Monitoring System, EU Bioeconomy Strategy 10th anniversary, Woody biomass flows in the EU, Guidance on managing resilient ecosystems); and a 'Knowledge Centre for Bioeconomy' navigation menu with tabs for Overview, Topics, Countries, Resources, News, Events, and About. The 'Countries' tab is active, showing a list of countries: Austria, Cyprus, Finland, Belgium, Czechia, France, Bulgaria, Denmark, and Germany. Below the navigation menu are three columns: 'Latest news', 'Next events', and 'Latest resources', each listing recent updates.

Source: K4P website.

A search can be performed through all types of knowledge categories returning results for all content types, or directly selecting one category either in the search interface, menu bar or 'Latest news', 'Next events', 'Latest resources' section (**Figure 4**). The search results can then be narrowed down using the filters on the left side of the page (**Figure 5**). The filters vary depending on the type of content (e.g. 'Year of publication' only appears when searching for publications).

Figure 4. Example search

Example: search for biomass in all content types

Search results can be filtered

biomass Search

Search options

Knowledge service
Bioeconomy (534)

Content type

- Publication (311)
- News (65)
- Glossary item (44)
- Dataset (40)
- Event (21)
- Page (18)
- Online Resource (11)
- Visualisation (11)
- Topic / Tool (5)
- Navigation page (4)
- Organisation (3)
- Projects and activities (1)

Search results (534)
Showing results 1 to 10

Knowledge service Bioeconomy

VISUALISATION | 11 FEBRUARY 2022
[Biomass Flows](#)
Explore the supply and use of agricultural, forestry and fisheries biomass in the EU.

VISUALISATION | 11 FEBRUARY 2022
[Spatial distribution of biomass production](#)
Zoom in to explore, pixel by pixel, the spatial distribution of agricultural residue production in the EU.

VISUALISATION | 11 FEBRUARY 2022
[Agricultural biomass production per Member State](#)
Discover which Member States produce the largest amount of agricultural biomass (economic production and residues) by crop group and specific crop.

Knowledge service topics
Choose

Project/Activity
Choose

Related organisations
Choose

Geographic coverage
Choose

KS specific taxonomy

Bioeconomy keywords

- Bio-based chemicals and materials (52)
- Algae (46)
- Biorefinery (32)
- Heating (15)
- pulp and paper (13)
- Blue economy (6)

Digital Europa Thesaurus
Search...

- biomass (276)
- bioenergy (137)
- biofuel (75)
- bio-based product (69)
- forest (65)
- sustainable development (64)
- bioeconomy (49)

Source: K4P website.

Figure 5. Narrowed search results by using filters

Applied filters for above search for biomass in all content types

biomass Search

Search options

Knowledge service
Bioeconomy (4)

Content type
 Publication (4)

Publication type
Choose

Year of publication
2022 (4)

Knowledge service topics
Choose

Project/Activity
Choose

Related organisations
Choose

Geographic coverage
Choose

Search results (4)
Showing results 1 to 4

Knowledge service Bioeconomy Digital Europa Thesaurus wood product Content type Publication

PUBLICATION | 31 JANUARY 2022
[Forest-based bioeconomy and climate change mitigation](#)
Forests and forestry play a key part in the global carbon cycle and are central to efforts to achieve the 2015 Paris Agreement goals and limit global temperature increases...

PUBLICATION | 18 JANUARY 2022
[Sankey diagrams of woody biomass flows in the EU - 2021 release](#)
A new release of Sankey diagrams of woody biomass flows in the European Union as a whole are available for the years 2009 to 2017 on the European Commission Knowledge Centre for Bioeconomy...

PUBLICATION | 21 JANUARY 2022
[The role of scientists in EU forest-related policy in the Green Deal era](#)
Forests are under pressure to provide biomass for different uses, but also to mitigate climate change and house biodiversity. In the EU, there is an intense debate around which...

PUBLICATION | 27 JANUARY 2022
[Sankey diagrams of woody biomass flows in the European Union](#)
Browse the Sankey diagrams and visualise the woody biomass flows within the forest-based sector in the European Union (2009-2017 data).

Source: K4P website.

3.3.2 Knowledge organised by topic

An audience research undertaken by the JRC in 2018 to understand the needs and expectations of policymakers and scientists towards the K4P platform concluded that the resources published should be organised following a linked knowledge pyramid structure (Lowry, 2018): highly granular data and information underpinning the scientific knowledge, useful for scientists, which could be coupled with synthesised knowledge resources, dedicated summaries and visualisations, useful for policymakers. The latter makes the so-called “policy layer”: in other words featured webpages with curated knowledge on a topic which makes it more accessible and usable to the world of policy, using for example videos, visualisations, short knowledge synthesis, briefs and other related content from the library.

In the period 2019–2022, the Knowledge Centre for Bioeconomy has developed six new topic pages and updated two topic pages first developed in 2017, focusing on specific sectors or perspectives of the bioeconomy:

- Policy, first published in 2017¹¹
- Economy, first published in 2017¹²
- Agricultural biomass, published in May 2020¹³
- Forestry biomass, published in November 2020¹⁴
- Algae biomass, published in March 2021¹⁵
- Assessing environmental impacts, published in June 2021¹⁶
- Fisheries and aquaculture biomass, published in July 2021¹⁷
- Forest-based bioeconomy for climate change mitigation, published in February 2022¹⁸

Each topic page is composed of a top layer, including a dedicated video (about 2-minutes), as a teaser to introduce the main messages related to the topic, inviting the audience to dig into a more in-depth content. The next layer is composed of a dedicated knowledge for policy brief, which synthesises currently available knowledge on the topic, so that it can be used directly in policymaking, and includes visualisations, tables, references in a targeted language.

The inner layer of the topic page is composed by three additional sections:

- ‘Explore further’ includes latest data, visualisations, projects and additional selected resources available on the topic. It is relatively stable content, updated as soon as new relevant resources are selected. The ‘Explore further’ section is presented as blocks of content, each of them with a short description of the identified knowledge resource preceded by a “call for action” statement.
- Featured content: Featured content as in the homepage can also be used in topic pages, but is not mandatory.
- ‘Latest knowledge’ are the latest news and publications made available on the KCB website, tagged with that specific topic. It is a more dynamic section, linked to the regular (weekly) KCB library update.

¹¹ https://knowledge4policy.ec.europa.eu/bioeconomy/topic/policy_en

¹² https://knowledge4policy.ec.europa.eu/bioeconomy/topic/economy_en

¹³ https://knowledge4policy.ec.europa.eu/bioeconomy/topic/agricultural-biomass_en

¹⁴ https://knowledge4policy.ec.europa.eu/bioeconomy/topic/forestry-biomass_en

¹⁵ https://knowledge4policy.ec.europa.eu/bioeconomy/topic/algae-biomass_en

¹⁶ https://knowledge4policy.ec.europa.eu/bioeconomy/topic/assessing-environmental-impacts_en

¹⁷ https://knowledge4policy.ec.europa.eu/bioeconomy/topic/fisheries-aquaculture-biomass_en

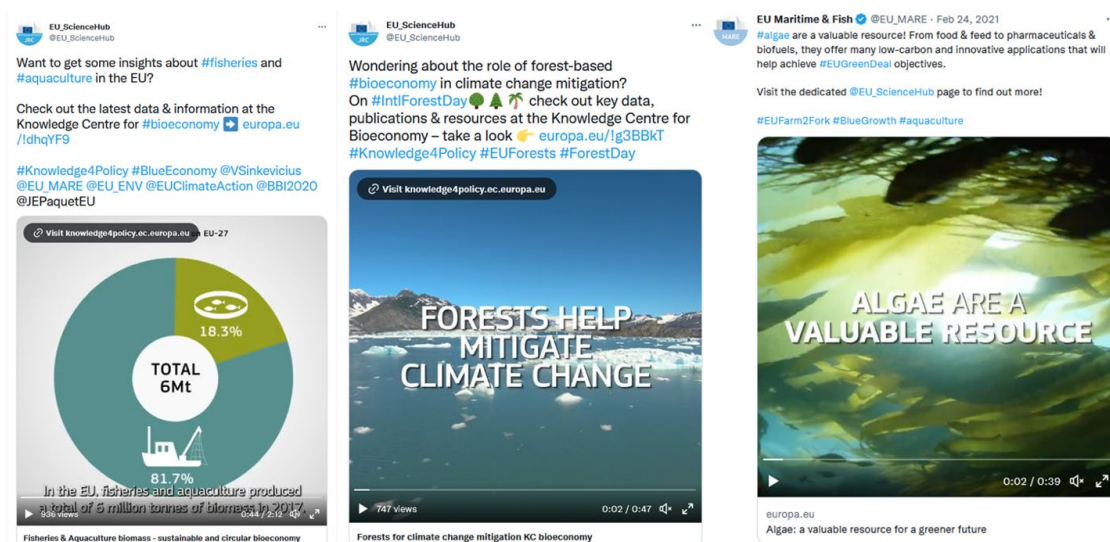
¹⁸ https://knowledge4policy.ec.europa.eu/bioeconomy/topic/forest-bioeconomy-cc-mitigation_en

3.3.3 Active dissemination

The KCB's web presence represents the primary dissemination channel of the knowledge collected, and curated. It offers a one-stop-shop allowing users to access knowledge resources using different search criteria depending on their requirements and needs. It is complemented by other dissemination channels that are used to actively share some specific content to targeted audience at specific points in time.

For example, newly published knowledge resources and especially the ones created by the JRC as contribution to the KCB or new collated topic pages are often actively communicated on social media, including through EC corporate social media accounts, reaching out to relevant multipliers. Examples of dissemination via Twitter are shown in **Figure 6**.

Figure 6. Examples of dissemination promoted by the KCB via social media

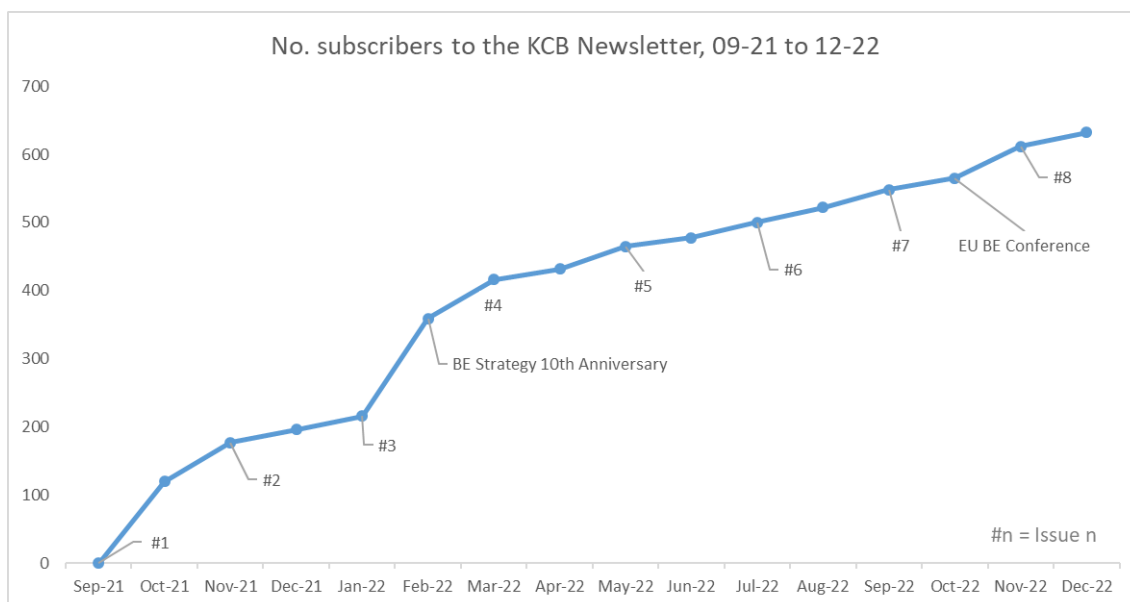


Source: Twitter.

Furthermore, in September 2021 the KCB launched a bi-monthly Newsletter¹⁹ to push and actively share information on some of the latest publications and news relevant for policymaking in the field of bioeconomy. The subscription to the newsletter is open to anyone interested. At the end of 2022, more than 630 people had subscribed, including policy officers in Commission DGs, JRC colleagues, staff from EU institutions like Bio-based Industries Joint Undertaking (BBI, currently Circular Bio-based Europe), the European Environmental Agency (EEA), civil servants and academics in Member States. The number of subscribers is increasing as new issues of the newsletter become available (see **Figure 7**).

¹⁹ https://ec.europa.eu/newsroom/know4pol/subscription-quick-generic-form-fullpage.cfm?service_id=2358

Figure 7. Evolution of the numbers of subscribers to the KCB newsletter in the period 09/21-12/22



Source: Own elaboration – Data from Newsroom (BE: Bioeconomy).

Finally, the knowledge curated for the KCB library also feeds the ESPAS²⁰ Horizon Scanning exercise. This is a project launched in November 2021 by EC's JRC Competence Centre on Foresight²¹, together with the European Parliament's European Parliamentary Research Service²², under ESPAS network²³, with the aim to identify signals of change that could potentially have an important impact on the future of the EU (Störmer et al., 2020).

The complete and detailed workflow followed by the KCB team is represented in **Figure 8**. This summarises all the steps described in section 3 and includes information about the frequency of updates and the resources needed.

²⁰ The European Strategy and Policy Analysis System (ESPAS) provides a framework for cooperation and consultation at administrative level between the European Parliament, the European Commission, the Council of the European Union, and the European External Action Service, with the European Investment Bank, the Committee of the Regions, the European Economic and Social Committee, the European Union Institute for Security Studies and the European Court of Auditors as observers, to work together on medium and long-term trends facing or relating to the European Union.

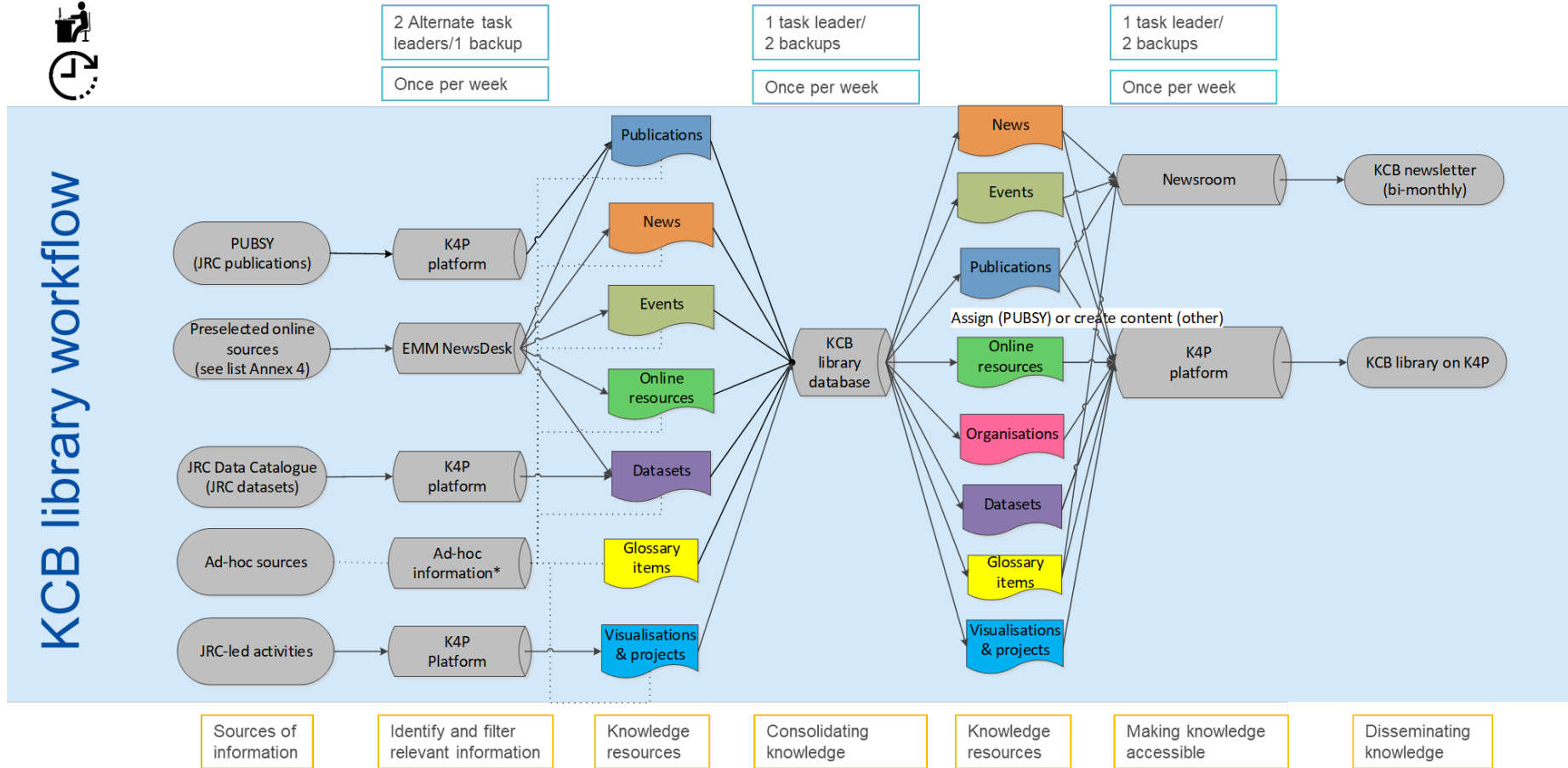
²¹ https://knowledge4policy.ec.europa.eu/foresight_en

²² <https://www.europarl.europa.eu/at-your-service/en/stay-informed/research-and-analysis>

²³ <https://espas.eu/>



Figure 8. KCB library workflow process



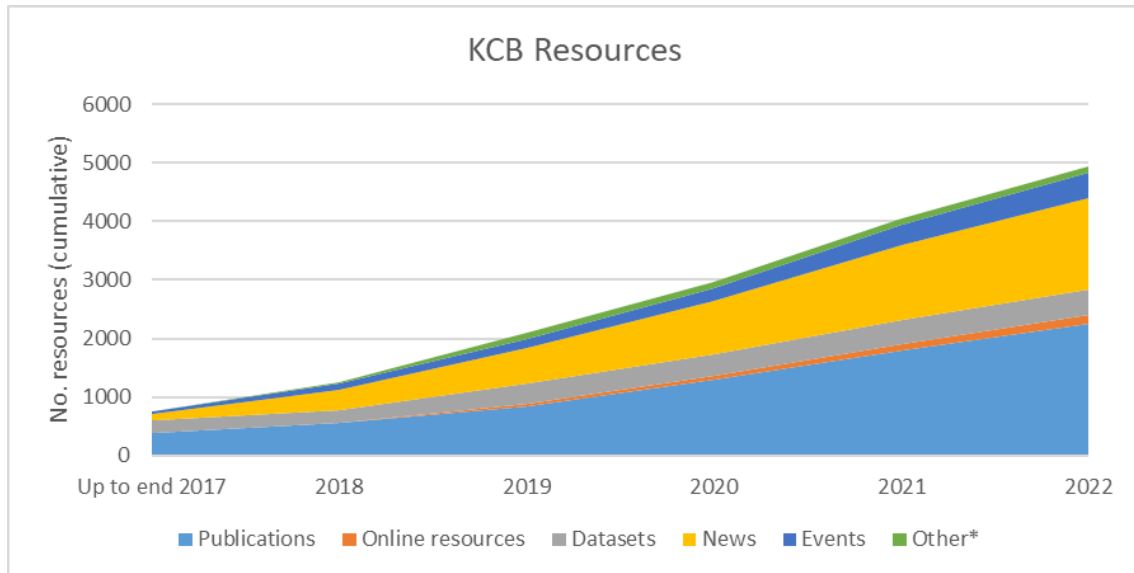
Source: Own elaboration.

4 Outputs

4.1 Knowledge resources available

At the end of 2022, the KCB library contained more than 5300 curated resources: 2235 publications; 150 online resources; 435 datasets; 1595 news items; 426 events; 2 projects; 23 visualisations and 79 organisations²⁴.

Figure 9. Time evolution of the resources integrated in the KCB library



Source: Own elaboration - * visualisations, projects, organisations.

²⁴The number of resources currently available in K4P Bioeconomy website is slightly less than the cumulative number of resources inserted in the website (Figure 9), because some items have been removed or archived due to obsolescence, as a result of the curation process.

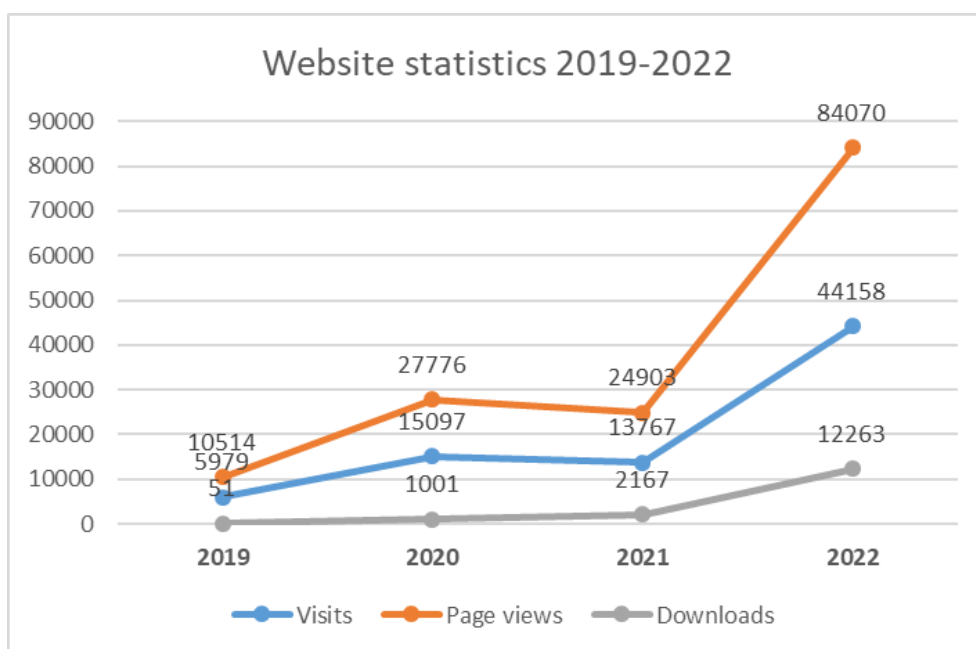
4.2 Take up

Statistics on visits, page views and downloads are available since 2019, when the KCB's web presence and its library migrated to the K4P platform. Until the end of 2021, the web statistics cover the accesses only to the homepage, topic pages and other special pages (i.e. everything under [https://knowledge4policy.ec.europa.eu/bioeconomy/...](https://knowledge4policy.ec.europa.eu/bioeconomy/)), not to specific resources. This changed in 2022, when also resources which are at K4P level (publications, online resources, projects and activities, news and events, for example [https://knowledge4policy.ec.europa.eu/publication/...](https://knowledge4policy.ec.europa.eu/publication/)) were linked to the Knowledge Services in the web statistics. This explains the strong increase in 2022 (**Figure 10**). In general, access has increased over time. A focus regarding the views of the pages dedicated to specific bioeconomy topics is reported in **Figure 11**.

In 2022 most of visitors to the KCB website are from the European Union (51.5%), followed by Asia (20.4%) and North America (10.1%) (**Figure 12**). The visitors from European Union Member States are particularly from Italy (14.3%), Germany (13.4%), Belgium (11.6%), Spain (8.6%), France (7.5%) and The Netherlands (6.9%) (**Figure 13**), all countries that are very active in the bioeconomy domain.

Apart from statistics of the website visits and interactions, qualitative feedback was collected from the EC policy DGs, in the context of the evaluation of JRC activities under Horizon 2020 by a committee of independent experts (JRC, 2022). In general, the policy officers in a partner DG provided positive feedback, claiming that thanks to the work of the Knowledge Centre for Bioeconomy, the JRC played a central role for the EU bioeconomy strategy, supporting the Commission by developing the scientific and technical knowledge on the various components of the bioeconomy (social, economic, environmental) and contributing to its implementation. The feedback of the committee of independent experts was also positive, especially as regards policymaking significance, territorial outreach, and stakeholders outreach, as well as public debate significance, the latter especially thanks to the curation efforts for the KCB library, mentioning articles that recognise the centrality of the 'Knowledge Centre for Bioeconomy' to increasing awareness and impact of the bioeconomy at the European level.

Figure 10. KCB platform visits and page views at the url: <https://knowledge4policy.ec.europa.eu/bioeconomy/>²⁵

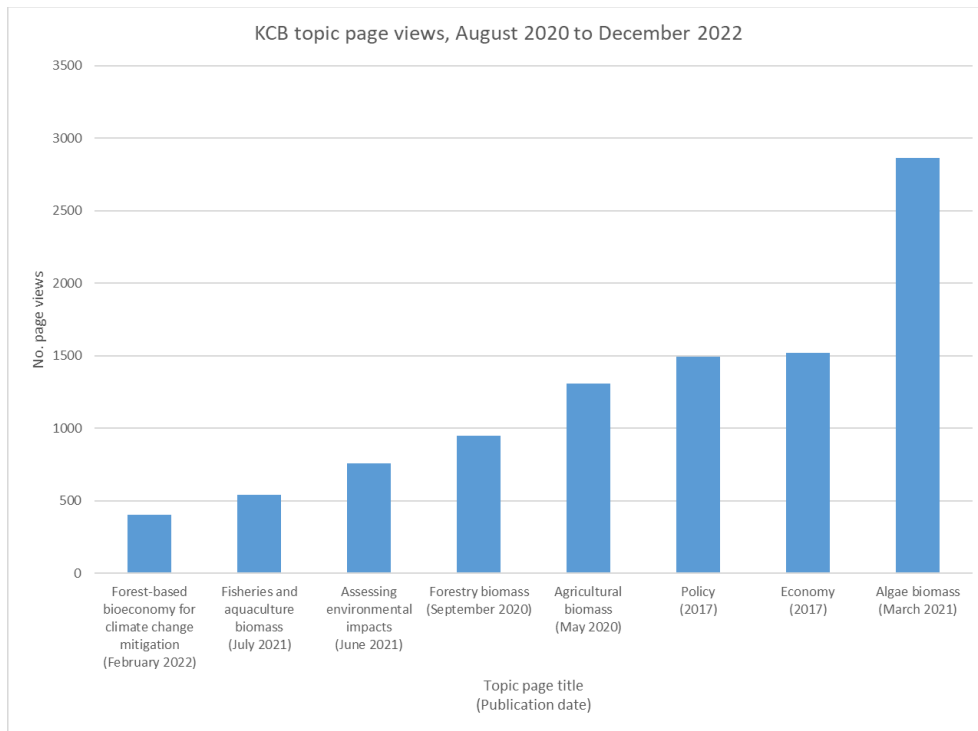


Source: Own elaboration – please note that from Jan 2022 the website statistics are counted differently²⁶.

²⁵ <https://webanalytics.europa.eu/analytics/>

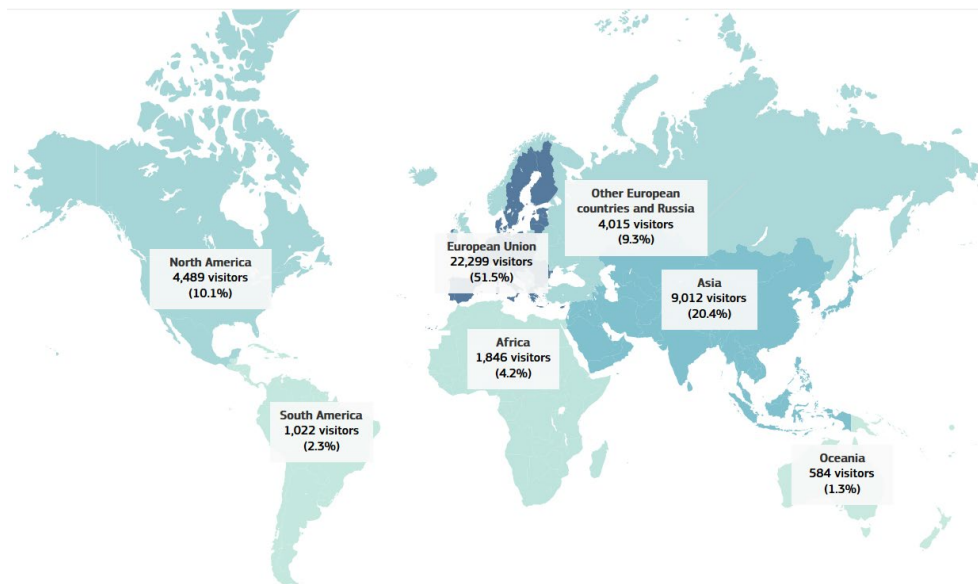
²⁶ Statistics on visits, page views and downloads are available since 2019, when the KCB's web presence and its library migrated to the Knowledge4Policy platform. Until the end of 2021, the web statistics cover the accesses only to the homepage, topic pages and other

Figure 11. Page views of the KCB topic pages



Source: Own elaboration.

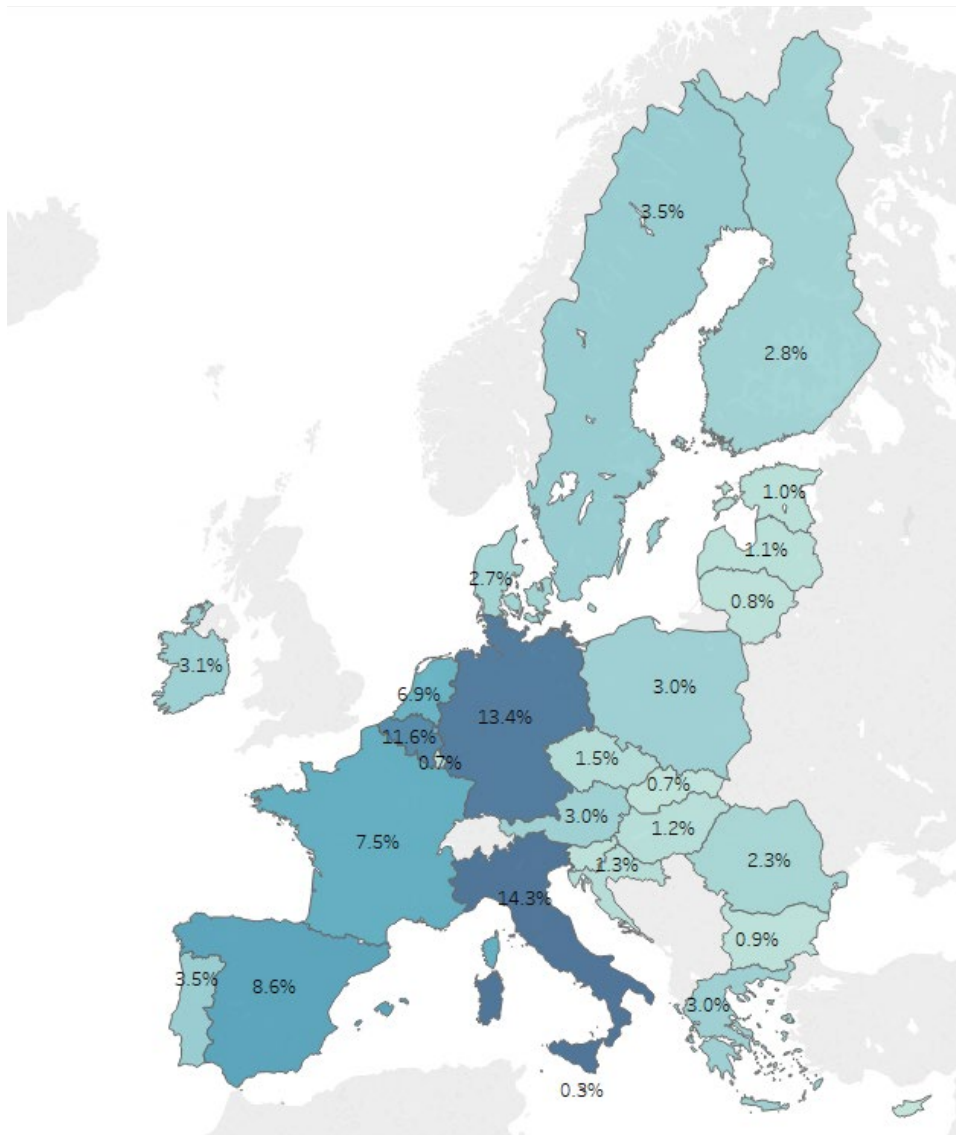
Figure 12. Number of visitors of the KCB website, by continent



Source: Own elaboration.

special pages (i.e. everything under <https://knowledge4policy.ec.europa.eu/bioeconomy/>), not to specific resources. This changed in 2022, when also resources which are at K4P level (publications, online resources, projects and activities, news and events, for example [https://knowledge4policy.ec.europa.eu/publication/...](https://knowledge4policy.ec.europa.eu/publication/)) were linked to the Knowledge Services in the web statistics. This explains the strong increase in 2022.

Figure 13. Number of visitors of the KCB website, focus on Europe



Source: Own elaboration.

5 Concluding remarks

The KCB online library provides a one-stop shop for filtered and distilled knowledge on bioeconomy to support evidence-informed EU policymaking. Its strength is the relevance, quality and accessibility of its resources as a result of a curation process and methods that emerged from a series of gradual improvements and optimisations based on the lessons learnt over the previous years. The access statistics and the consistently positive qualitative feedback received by bioeconomy stakeholders (see Section 4.2), demonstrate that the online KCB library produces an added value which far exceeds the circa 1 FTE currently invested in it.

The fact that contents are recorded and categorised across time in a consolidated database (see section 3.22) gives the possibility to always come back to the list of resources and check what is present in the library, even in the occasion of a failure of the website. In this sense, the KCB library is robust and reliable. Moreover, sharing the work between various staff has the advantage to have a continuous process, where colleagues back up each other in case of need, so that the scanning, selection and publication process is not interrupted.

Nevertheless, the approach followed has also certain limitations, both technical and methodological, and has scope for further improvement.

A first technical limitation is the fact that the workflow uses different platforms that are not necessarily connected to each other. For example, the main selection from the scanners is performed in EMM Newsdesk environment, currently not integrated in the K4P Platform. Thus, the web content manager has to manually copy the items from EMM environment to the K4P website. An integration of the two environments would address this issue.

As a second technical limitation, there are delays due to the existence of different parallel workflows in place the JRC publication quality system (PUBSY) is sometimes delayed with respect to the preprint of papers in scientific journals. This means that the knowledge resource (in this case, the scientific article) is available in the internet but cannot be linked on the KCB website because the official Commission approval workflow has not been terminated.

Finally, despite the criteria applied for the curation, the gradual expansion of the library over the years creates risks as the resources can become outdated or inaccessible and thus obsolete. Prioritisation of resources with an expected longer life span and regular maintenance and cleaning of the resources as well as of the preselected online sources in EMM and related alerts (see Annexes 1 and 2) will be key in order to maintain the library fit for purpose.

In terms of methodological limitations, firstly, there is a general risk of bias associated to the expert judgement applied for the manual selection of resources. This risk has been reduced by the adoption of a specific set of agreed criteria, however it is not eliminated. Sharing of the selection work between at least two experts that can cross-check each other's work can further reduce this risk, but would entail the involvement of additional resources.

Secondly, there is a systematic bias due to the use of the English language only. This means that all the bioeconomy-relevant news and publications that are published in other languages are automatically discarded from the outset even if they could meet the relevance and quality criteria (see section 3.1). Overcoming this limitation might attract visitors from additional EU countries.

Thirdly, based on the selection criteria, industry news are typically not selected to avoid risk of commercial bias, even if they may be interesting and relevant, and academic publications whose abstracts are not public, are also not captured. This means that the resources included in the KCB library may lack relevant elements of industrial innovation and research advances that can add to the collective knowledge.

With this report, the authors document the workflow and methods applied, take stock of the work done and reflect on what can be improved to possibly serve as a source of inspiration for other knowledge management services.

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List of abbreviations and definitions

BE	Bioeconomy
EC	European Commission
EMM	European Media Monitor
DET	Digital Europa Thesaurus
DG	Directorates-General
ESPAS	European Strategy and Policy Analysis System
JRC	Joint Research Centre
FP	Framework Programme
FTE	Full Time Equivalent
K4P	Knowledge4Policy platform
KC	Knowledge Centre
KCB	Knowledge Centre for Bioeconomy
KS	Knowledge Service
PUBSY	Corporate management system for JRC outputs

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Annexes

Annex 1. Preselected online sources in EMM currently used²⁷

1	Australian Renewable Energy Agency http://arena.gov.au/	79	International Energy Agency http://www.iea.org
2	Bio-based Industries Consortium http://biconsortium.eu/	80	International Food Policy Research Institute http://www.ifpri.org/
3	Bio-based News http://bio-based.eu/news/ccu/	81	International Panel of Experts on Sustainable Food Systems http://www.ipes-food.org/
4	Bio-based Delta http://biobaseddelta.nl/en	82	International Service for the Acquisition of Agri-biotech Applications (ISAAA) http://www.isaaa.org/
5	European Bioeconomy Alliance http://bioeconomyalliance.eu/	83	Joint Programming Initiative Healthy and Productive Seas and Oceans http://www.jpi-oceans.eu/
6	The Bioeconomy blog http://bio-literacy.blogspot.be/	84	Marine Biotechnology Era-NET http://www.marinebiotech.eu/
7	Biomass magazine http://biomassmagazine.com/	85	Nordic and Baltic forests and forestry http://www.nbforest.info/
8	The Bioeconomy Council http://bioekonomierat.de/en/	86	New Economics Foundation http://www.neweconomics.org/publications
9	Biotechnology now http://biotech-now.org/	87	Bioeconomy Consultants http://www.nnfcc.co.uk/
10	Bioeconomy in the Baltic Sea Region http://bsrbioeconomy.net/	88	Nordregio Research Centre http://www.nordregio.org/
11	Circulate http://circulateneews.org/category/news/	89	Nordregio Magazine http://www.nordregio.org/nordregio-magazine/#
12	Commnet – Communicating the bioeconomy http://commnet.eu	90	OECD website http://www.oecd.org/
13	Committee of the Regions http://cor.europa.eu/	91	Plants for the Future European Technology Platform http://www.plantetp.org/
14	Cordis http://cordis.europa.eu/	92	Vanguard Initiative http://www.s3vanguardinitiative.eu
15	European Aquaculture Technology and Innovation Platform http://eatip.eu/	93	Scidev Publications http://www.scidev.net/global/
16	Directorate General Agriculture and Rural Development http://ec.europa.eu/agriculture	94	Sciencedirect http://www.sciencedirect.com/
17	Directorate General for Energy http://ec.europa.eu/energy	95	European Technology Platform for Sustainable Chemistry http://www.suschem.org/
18	Directorate General for Energy http://ec.europa.eu/environment	96	Biojournal of Science and Technology http://www.thebiojournal.com/
19	Statistical Office of the European Union http://ec.europa.eu/eurostat/	97	The Guardian http://www.theguardian.com/uk
20	Directorate General for Regional policy http://ec.europa.eu/regional_policy	98	Valbiom http://www.valbiom.be/

²⁷ This list contains websites which have been used in years 2017–2022 to retrieve knowledge resources about the bioeconomy. Some sources are obsolete or archived. They are marked with an asterisk *.

21	Directorate General for Research http://ec.europa.eu/research	99	VTT Research http://www.vttresearch.com/
22	European Environmental Bureau http://eeb.org/	100	Joint Programming Initiative "Water challenges for a changing world" http://www.waterjpi.eu/
23	Bioeconomy Cluster http://en.bioeconomy.de/	101	World Resources Institute http://www.wri.org/
24	ETP 'Food for Life' http://etp.fooddrinkeurope.eu/	102	Bioeconomy Investor* https://bioeconomyinvestor.com/
25	EU Bioenergy http://eubioenergy.com/	103	Data-Modelling platform of resource economics https://datam.jrc.ec.europa.eu/datam/public/pages/index.xhtml
26	Commission Press Corner http://europa.eu/rapid/latest-press-releases.htm	104	Directorate General for Climate Action https://ec.europa.eu/clima/
27	Commission Press Corner RSS http://europa.eu/rapid/rss.htm	105	Agricultural European Innovation Partnership https://ec.europa.eu/eip/agriculture/
28	FERN http://fem.org/	106	Directorate General for Oceans and Fisheries https://ec.europa.eu/fisheries/
29	The Food Tank http://foodtank.com/	107	JRC Publications Repository https://ec.europa.eu/jrc/en/publications-list
30	Forest Portal EFI* http://forestportal.efi.int/	108	EU Agenda https://euagenda.eu/
31	Global Green Growth Institute http://gggi.org/	109	Euobserver https://euobserver.com/
32	Green Chemicals Blog http://greenchemicalsblog.com/	110	EuroAlert* https://euroalert.net/
33	Groen Kennis net http://groenkennisnet.nl/	111	EU Newsroom https://europa.eu/newsroom/home_en
34	Il bioeconomista http://ilbioeconomista.com/	112	Fachagentur Nachwachsende Rohstoffe e.V. https://international.fnr.de/
35	Imperial College London http://imperial.ac.uk/	113	Making of tomorrow* https://makingoftomorrow.com/
36	Irena Newsroom* http://irenanewsroom.org/	114	University of California Irvine https://news.uci.edu/
37	Joint Programming website http://jointprogramming.nl/	115	US National Institute of Food and Agriculture https://nifa.usda.gov/
38	Bio-based news http://news.bio-based.eu/	116	Journal of Product Innovation Management https://onlinelibrary.wiley.com/journal/15405885
39	Nordic Forest Research http://nordicforestresearch.org/	117	Precision economy* https://precisioneconomy.com/
40	OECD Observer* http://oecdobserver.org/	118	Publications Office of the European Union https://publications.europa.eu/en
41	Wiley online library http://onlinelibrary.wiley.com	119	Standing Committee on Agricultural Research https://scar-europe.org/
42	Road to Paris website* http://roadtoparis.info/	120	Aberystwyth University https://www.aber.ac.uk/
43	Sustainable Chemical Processes http://sustainablechemicalprocesses.com/	121	Bio-based Industry Joint Undertaking https://www.bbi-europe.eu/
44	European Technology Platform on organic foods and farming http://tporganics.eu/	122	Be-basic foundation https://www.be-basic.org/
45	United Nations Climate Change http://unfccc.int/	123	Biotechnology Innovation Organisation https://www.bio.org/

46	Water Europe http://wsstp.eu/	124	Biobased World News* https://www.biobasedworldnews.com
47	European Bioenergy http://www.aebiom.org/	125	Bioplastics magazine https://www.bioplasticsmagazine.com/en/news
48	AllthingsBio http://www.allthings.bio/	126	European Central Bank https://www.ecb.europa.eu/
49	Biotechnology and Biological Sciences Research Council http://www.bbsrc.ac.uk/	127	The Economist https://www.economist.com/
50	Be Sustainable Magazine http://www.besustainablemagazine.com/	128	Ellen Macarthur Foundation https://www.ellenmacarthurfoundation.org/
51	Bio-based Economy NL http://www.biobasedeconomy.nl/	129	Ends Europe https://www.endseurope.com/
52	Bio-based press http://www.biobasedpress.eu/	130	ERA LEARN https://www.era-learn.eu/
53	The Bioeconomy Digest http://www.biofuelsdigest.com/	131	European Regions Research & Innovation Network https://www.errin.eu/
54	Biofuels Journal http://www.biofuelsjournal.com/	132	Euractiv https://www.euractiv.com/
55	Biofuels International http://www.biofuels-news.com	133	European Bioplastics https://www.european-bioplastics.org/
56	Birdlife Europe and Central Asia http://www.birdlife.org/europe-and-central-asia	134	European State Forest Association https://www.eustafor.eu/
57	The B Team http://www.bteam.org/	135	Centre for Research on Globalisation https://www.globalresearch.ca/
58	European Chemical Industry Council http://www.cefic.org/	136	Greenpeace International https://www.greenpeace.org/international/
59	Cell Journal http://www.cell.com/	137	Joint Programming Initiative 'A Healthy Diet for a Healthy Life' https://www.healthydietforhealthylife.eu
60	Climate Knowledge and Innovation Community http://www.climate-kic.org/	138	International Atomic Energy Agency https://www.iaea.org/
61	Council of the European Union http://www.consilium.europa.eu/en/	139	Innovation policy platform* https://www.innovationpolicyplatform.org/
62	Ecofys – energy and climate consultancy* http://www.ecofys.com/en/press/	140	Nature https://www.nature.com/
63	European Forest Institute http://www.efi.int/portal/	141	National Library of Medicine https://www.ncbi.nlm.nih.gov/pubmed/
64	European industrial research management association http://www.eirma.org	142	Oxfam International https://www.oxfam.org/fr
65	Enalgae project* http://www.enalgae.eu/	143	Politico EU https://www.politico.eu/
66	Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile (Italy) http://www.enea.it	144	PoliticsHome https://www.politicshome.com/
67	Group of the European People's Party* http://www.eppgroup.eu/	145	Researchgate* https://www.researchgate.net/directory/publications
68	European Technology and Innovation Platform http://www.etipbioenergy.eu/	146	Smithsonian Magazine https://www.smithsonianmag.com/

69	Eureporter http://www.eureporter.co/	147	Journal of Pharmaceutical Innovation https://www.springer.com/biomed/pharmacology+&+toxicology/journal/12247
70	Euronews http://www.euronews.com/	148	Starch Europe https://www.starch.eu/
71	Europabio http://www.europabio.org/	149	Irish Agriculture and food development authority https://www.teagasc.ie/
72	European Parliament news http://www.europarl.europa.eu/news/en	150	The Courier https://www.thecourier.co.uk/
73	Farm Animal Breeding & Reproduction Technology Platform http://www.fabretp.eu/	151	The Parliament https://www.theparliamentmagazine.eu/
74	FAO news http://www.fao.org/news/en/	152	University of Hohenheim – Bioeconomy masters https://www.uni-hohenheim.de/en/bioeconomy-masters
75	EU vegetable oil and proteinmeal industry association http://www.fediol.be/	153	UPM Biofore https://www.upmbiofore.com/
76	FIS world news* http://www.fis.com/fis/worldnews/	154	Wageningen University and Research https://www.wageningenur.nl/
77	Forest-based sector Technology Platform http://www.forestplatform.org/#/	155	World Economic Forum Agenda https://www.weforum.org/agenda/
78	Global Bioenergies http://www.global-bioenergies.com/	156	Netherlands Enterprise Agency www.rvo.nl/

Annex 2. List of EMM alerts for the selected sources

Keyword	Weight	Keyword	Weight
algae	25	biofuel%	50
bio%+plastic%	50	biogas	50
bio%+polymer%	50	bio-gas%	50
bio%ethanol	50	biomass	50
bio%-ethanol	50	biomaterial%	50
bio%-plastic%	50	bioplastic%	50
bio+based	50	biopolymer%	50
bio+econom%	25	bio-polymer%	50
bio+energ%	50	biorefiner%	50
bio+fuel%	50	biotech%	25
bio+gas%	50	biotechnolog%	25
bio+liquid%	50	bio-technolog%	25
bio+waste%	50	biowaste%	50
biobased	50	bio-waste%	50
bio-based	50	circular+econom%	50
biochemical%	50	energy+crop%	50
bio-chemical%	50	feedstock%	50
biodiesel%	50	food+waste%	50
bioeconom%	50	organic+waste%	50
bio-econom%	50	renewable+biological+resource%	50
bioenerg%	50	renewable+raw+material%	50
bio-energ%	50	Vaccin%	-999

“%” (percent): replaces 0, 1 or more letters. E.g. origin% would match original, originality, originally, originate, originating, originator, origination...

“+” (white space): can be used to build or unite term strings (E.g. olympic+games), replacing one or more blanks/punctuations. It does not work with the following typographic symbols: “&” (ampersand) and “-” (dash).

Annex 3. Criteria for knowledge resources made accessible via the KCB platform

News

1. Is the news item available for open access?
2. Is the news item relevant for the bioeconomy from a scientific or policy angle?
3. Is the source of the news item clearly identified?
4. Is the news item reporting facts (rather than an opinion) and gives evidence to support its main points?
5. Is the news item written at an appropriate language level (i.e. not too elementary or advanced)?
6. Does the language or tone seem unbiased (incl. commercial or political bias) and free of emotion?
7. Is the news item openly accessible without restrictions (free or paid registration)?
8. Is the news item a feed from another platform? Can the original source of the news item be clearly identified?
9. Is the news item only about a recent publication? Does this news provide additional analysis of the outcome published?

The relevance and authenticity of the news item is somehow ensured by the selection of the sources from which the news are selected as well from the expert judgement.

Events

1. Is the event information available for open access?
2. Is the event relevant for the bioeconomy from a scientific or policy angle?
3. Is the event organised by EU institutions, or EU-funded projects, or MS administration, or academia, or international organisations, or organised by others and include representatives of EU institutions as speakers?
4. Does the event's purpose appear to be free from commercial or other form of bias?
5. Is the event openly accessible without restrictions (free or paid registration)?

Publications

1. Is the publication available for open access?
2. Is the publication relevant for the bioeconomy from a scientific or policy angle?
3. Is the source of the publication (author /publisher) clearly identified?
4. Does the publication appear to be free from commercial and other form of bias?
5. Would you be comfortable citing this source in your research paper?
6. Is the publication item openly accessible without restrictions (free or paid registration)?
7. Is the document published recently?

Additional criteria applied in the selection process may be specific to the type of publication and subject to expert judgement such as impact factor of the scientific journal (for peer-reviewed publications), official and authoritative nature of the publisher organisation (for e.g. technical and statistical reports), potential advocacy bias (for policy documents), or the topic relevance and correctness -from an ethical point of view- (for all publications).

Online resources

1. Is the resource available for open access?
2. Is the resource relevant for the bioeconomy from a scientific or policy angle?
3. Is there contact information, such as a publisher or email address?
4. Does the resource appear to be free from commercial and other form of bias?

Datasets

1. Is the dataset available for open access?

2. Is the dataset relevant for the bioeconomy from a scientific or policy angle?
3. Is there contact information, such as a publisher or email address?
4. Does the dataset appear to be free from commercial and other form of bias?

Organisations

Organisations included are those that produced knowledge (publications, datasets, online resources) that has been included.

Annex 4. Local KCB taxonomy

Algae
Bio-based chemicals and materials
Bio-based textiles
Biorefinery
Blue economy
Charcoal
Energy conversion
Food system
Food system transformation
Forest-based industry
Fossil-based
Fuel wood
Grassland
Heating
Irrigation
Low-carbon
Microbiology
Oilseed crop
Pellets
Power plant
Protein product
pulp and paper
Pulp and paper industry
Smart specialisation
Sustainable Food system
Waste disposal
Waste incineration

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EU law and related documents

For access to legal information from the EU, including all EU law since 1951 in all the official language versions, go to EUR-Lex (eur-lex.europa.eu).

Open data from the EU

The portal data.europa.eu provides access to open datasets from the EU institutions, bodies and agencies. These can be downloaded and reused for free, for both commercial and non-commercial purposes. The portal also provides access to a wealth of datasets from European countries.



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

Contact: EC-Bioeconomy-KC@ec.europa.eu

The European Commission's science and knowledge service

Joint Research Centre

JRC Mission

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