SCALE UP
community-driven
bioeconomy development

Region-specific information packages

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EXECUTIVE SUMMARY

This report presents the information packages that have been compiled for the bio-based solutions in six European rural regions. The information packages form an important knowledge base for the regional platforms that have been established under the SCALE-UP project. The structure and content of the packages have been developed and inspired by the results of the cross-regional assessment workshop and identified needs from the training survey which were held in the first year of the project.

The packages contain valuable information on EU- and local policies, EU-projects and on biomass availability, technical solutions and nutrient recycling possibilities. The packages vary per region in content and focus. This is due to large variations in available biomass resources and different interests in bio-based solutions. For example, North-Sweden was focussing on forestry residues and the Strumica region (North Macedonia) on using food production residues for composting.

Special attention has been given to the accessibility of the information. The package format is in Excel sheets with well-structured tabs, digital links to publications, and translation tools making articles understandable for local stakeholders. Packages are presented on the SCALE-UP website to make access easier, also by parties that are not participating in the regional platforms. The information has also been discussed and shared with the JRC Knowledge Centre for Bioeconomy.

The information packages have been reviewed by local stakeholders on their usefulness. The main conclusion is that the information packages can form a good potential source of information for regional bioeconomy development. Important factors remain the dedication to local solutions and regular actualisation of the information. These issues are addressed in the recommendations and are to be taken up by the regional platforms.

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1 Introduction

The information packages have been developed to support bio-based solutions in the six SCALE-UP-regions: Andalusia (Spain), the French Atlantic Arc (France), North Sweden, Mazovia (Poland), Strumica (North Macedonia) and Upper Austria. The packages summarise results from previous projects and sister projects. They bundle scientific and technical information on the assessment of resources, the possibilities for nutrient recycling and the production processes for bio-based products.

The information packages have been compiled to support knowledge transfer, capacity-building activities and other innovation support activities of the regional platforms.

This document describes the design and compilation of the packages (methodology) and presents the results for each region. Conclusions are presented on the process and results as well as recommendations to keep the packages up to date.

2 Methodology

The structure and content of the information packages was based on the results of the important cross-regional assessment workshop that was organised at the beginning of the SCALE-UP project. During this event, all participating regions shared their views on priorities, practical knowledge, capacities and gaps with respect to regional bio-based production. These first ideas were supported by the outcomes of the capacity needs assessment that was carried out for the design of the SCALE-UP regional training program.

The specific needs identified during the workshop, such as understanding regional priorities, sharing practical knowledge, assessing existing capacities, and gaps in bio-based production, were considered when developing the information packages. The following subjects were chosen to directly address these needs: EU policies, EU projects, local policies, scientific and technical information, and biomass availability and nutrients. This selection is justified as follows:

1. **EU policies**: EU's objectives and policies for a sustainable bioeconomy. By understanding these policies, stakeholders can align their activities and initiatives.
2. **EU projects**: The SCALE-UP project wants to build on the work of previous and ongoing EU-funded projects and collaborates with sister projects to enhance the development of regional bio-economies across Europe.
3. **Local policies**: This category includes the national and regional policies on the bioeconomy in the region. By understanding these policies, stakeholders can adjust their activities to the specific needs and priorities of the region.
4. **Scientific and technical information**: Information on the biomass processing routes. The SCALE-UP project supports innovation and relies on scientific and technical information for this. By accessing relevant scientific and technical information, stakeholders can stay up to date on the latest developments and identify opportunities for innovation.
5. **Biomass availability and nutrient recycling**: The SCALE-UP project aims at promoting bio-based production processes while respecting the ecological boundaries of the region and recognizes the importance of biomass availability and nutrient recycling in this. By collecting this information, stakeholders can make informed decisions on resource management and identify promising opportunities for bio-based production.

These five topics are essential components of the information packages for regional stakeholders. They provide guidance, best practices and scientific insights necessary for developing and implementing effective bio-based production systems tailored to the regions.

All available information on these five topics was subsequently collected by regional partners, then screened and analysed, structured and presented. The data collection process involved conducting comprehensive searches across several databases for peer-reviewed articles, reports, and studies. Targeted search terms related to bio-based production, EU policies, local bioeconomy strategies, biomass stream and processing technologies, biomass availability and nutrient recycling were used. Throughout the data collection phase, constant communication and collaboration between BTG and the regional partners ensured that all relevant data was included. This data was then documented and structured into information packages. The format chosen was an Excel file per region with a separate page for each subject. Each document includes detailed information on sources and publication details.

Key knowledge holders from each region were interviewed and asked to review the form and contents of the information packages, to verify their usefulness in practice. This approach ensured that the information packages address the specific needs and priorities of each region. This validation process was documented in the chapter titled "Feedback from the regions," highlighting how stakeholders reviewed and supported the information packages' applicability.

As can be seen in Figure 1, the information packages in the SCALE-UP project are designed to be dynamic and continuously updated documents. They serve as 'living documents' that evolve with new results, findings, and stakeholder feedback throughout the project activities. Key knowledge holders from the regions, alongside BTG and other project partners have provided feedback on the information packages. Additionally, regional platform activities, other SCALE-UP initiatives such as the training program, and outcomes from sister projects will continue to contribute to the information packages. This process ensures that the information packages include the latest knowledge and fit the evolving needs of stakeholders and bio-based production in the region.

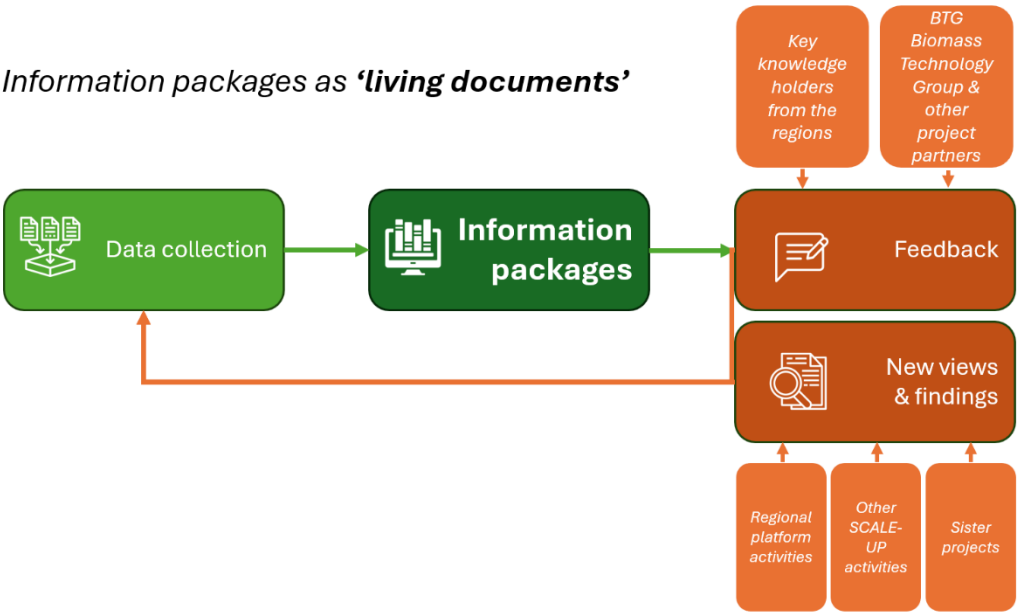

Figure 1: Information packages continuous update process

To enhance accessibility and communication, it was decided to design the information packages in such a way that could be presented on the website (see try-out on the SCALE-UP website for the North Sweden region in Figure 2). This way, stakeholders and other interested parties can easily view and download the information packages.

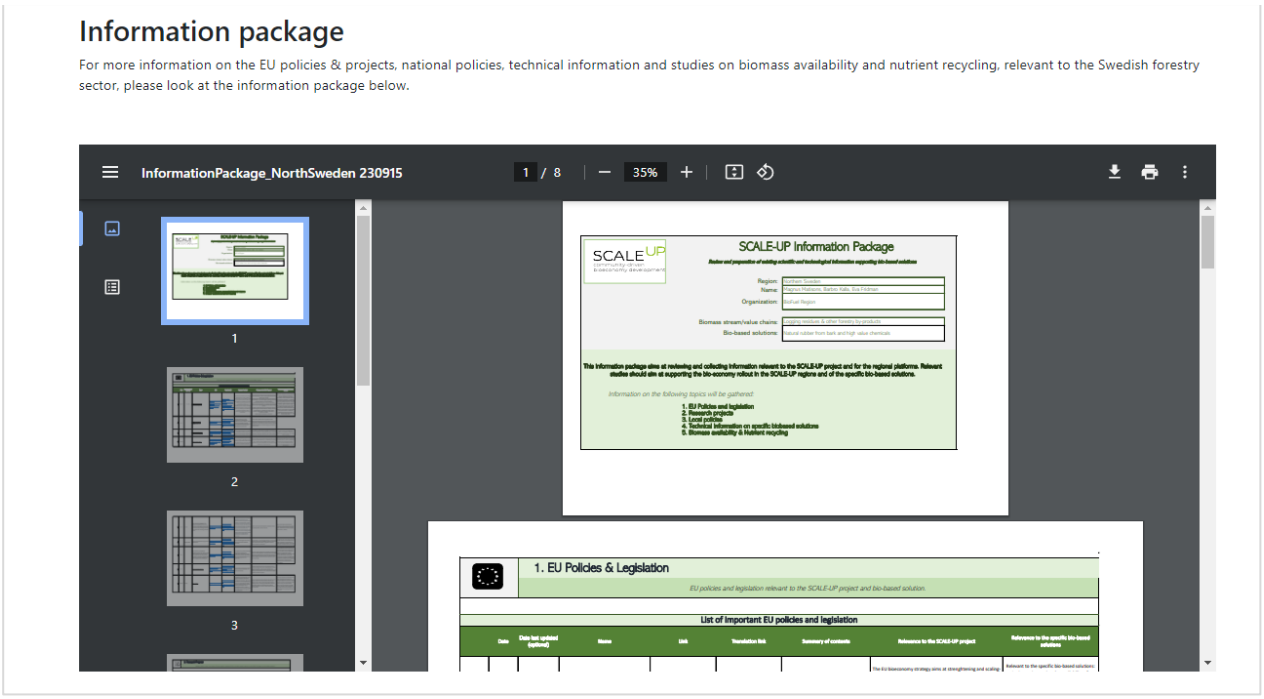

Figure 2: Information package embedded in SCALE-UP website.

Additionally, a tool was added that translates the information into the languages spoken in each region (see Figure 3). A demonstration was prepared and shared with the regional partners during a SCALE-UP coordination meeting.

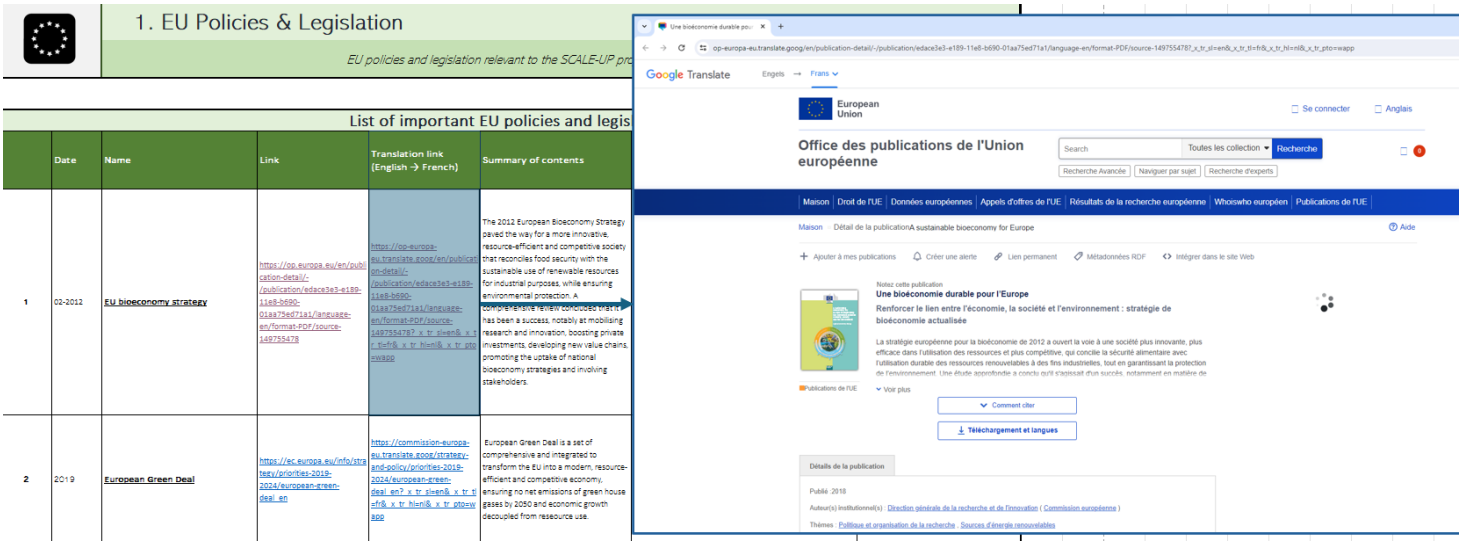

Figure 3: Example translation links in information package

3 Feedback from the regions

The regional partners shared (drafts of the) information packages with the members of their regional platforms through email, in which they asked the platform members to review the information packages. This led to the following feedback:

- In Poland, the information package was shared with all members of the regional platform. Seven members took part in an online meeting to discuss the information package. Here, the members mentioned that some of the information is not easily accessible due to a language barrier, as many English documents are included in the information package (Note: in the later version of the package, a translation tool was added). Another point of feedback was that some of the information is quite general and that the stakeholders would appreciate more specific information on the future of the bioeconomy in the region.
- In France, the information package got positive feedback from the regional platform. The stakeholders, from various companies working in the bioeconomy or in construction, provided new sources of information, which were included in the information package.
- In Upper Austria, the information packages were presented and discussed during one of the platform meetings. The stakeholders in attendance were happy with the document and had several suggestions of literature for the information package, which were later added to the document.
- In North Macedonia, four key knowledge holders were asked to provide feedback on the information package. The main message from these key knowledge holders was that the main documents that are relevant and of interest to the stakeholders in the region are covered in the information package and that no additions were needed.
- In Spain, several key knowledge holders with specific knowledge of the olive value chain were contacted and asked to review the contents of the information package. The key knowledge holders found the information package to be a very comprehensive document, with the correct and up-to-date information. Some small suggestions regarding formatting and clarifications were given and included in the information package.
- In Sweden, platform members have stressed the need for publication of the information package and biomass assessments on the website.

4 Information packages

Six regional information packages have been compiled and can be found in the Annex.

As the bio-based production routes vary, the interests of the regions and their platforms vary. This results in different contents of the information package per region. This is the case for the biomass availability and technical subjects, but also for the local policies. In Table 1, on the next page, an overview is given of the focus of the information package of each region.

Many publications exist on EU policies and EU projects. A good overview can be found at the Knowledge Centre for Bioeconomy. A link is therefore added in all regional information packages. Information from the Centre is valuable for the SCALE-UP project. In turn, following communication with the JRC-staff, information that comes available from the SCALE-UP project has been offered to the Knowledge Centre.

Despite various attempts, limited information could be obtained from the SCALE-UP sister projects, therefore this part of the information package is not complete yet. It will, however, be filled as results become available.

Table 1: Regional focus within categories of information packages.

Focus within information packages	*EU policies*	*EU projects*	*Local policies*	*Technical information*	*Biomass & nutrients*
Andalusia, Spain	The European Union has a range of policies, aimed at developing the EU bioeconomy. These are listed in each regional package. Policies directly influencing the bioeconomy are the EU bioeconomy strategy and the European Green Deal. Link to the EU JRC Knowledge Centre for Bioeconomy. Indirectly, policies such as the European Digital Strategy and European Data Strategy help provide information and support innovation in the bioeconomy.	Information on sister projects that also aim to support regional bio economies in different parts of Europe by supporting local bio-based solutions, organizing capacity-building events and establishing regional platforms (still to be completed). Information on previous EU-projects. Link to the EU JRC Knowledge Centre for Bioeconomy	Regional and national policies related to the bioeconomy, olive industry, circular economy, biodiversity, waste, and soil, as well as the CAP.	Reports and papers on olive production process and use of residues for bio-based products	Studies on the resource potential for prunings and secondary resources at the olive mills. Information on nutrient recycling possibilities, such as composting.
French Atlantic Arc			Regional and national policies for the bioeconomy, and more specifically the use of bio-based products in construction.	Reports and papers on straw and fibre crops (hemp, flax & miscanthus), and their use in construction.	Tools and reports on the availability of biomass resources and construction projects, and information on the cultivation of fibre crops.
North Sweden			Swedish policies on forestry, the bioeconomy and regional development.	Reports on the optimization of biomass in biorefineries and data on Swedish forests.	Reports and papers on forestry residues and attempts to bring nutrients back to the forests.
Mazovia, Poland			Mazovia regional economic development policy papers	Information on properties and various applications of apple pomace and other apple industry by-products.	Studies on bio-energy potential based on prunings and apple pomace.
Strumica, North Macedonia			National policies on (organic) agriculture, rural development, fertilizers, waste management, the environment and biodiversity.	Studies on compost, mycelium from agricultural residues, climate change impacts and adaptation, and data on agricultural activity.	Studies on the upcycling of nutrients through compost, and information on soil quality, natural resource management, and agricultural production.
Upper Austria			Policies related to the Austrian bioeconomy, economic and socio-political trends in the region, the generation of food waste, and the use of food waste for animal feed.	Various applications of brewers' spent grains, waste management for breweries and bakeries, and applications of bread in biogas, the chemical industry and for soil improvement.	Information on food production and waste in Upper Austria and its various applications, food waste prevention, and the nutrient contents of bread and bakery by-products.

5 Conclusions

There are the following conclusions and observations:

1. Regional partners were able to compile six region-specific information packages. They are a potentially useful tool for the development of regional bioeconomies. This was concluded from the reviews and feedback sessions among stakeholders. Key knowledge holders from the regions were asked to review the information packages, providing new insights and suggestions on enhancing the format and accessibility.
2. The specific needs identified during the workshop and capacity needs assessment, such as understanding regional priorities, sharing practical knowledge, assessing existing capacities, and gaps in bio-based production, lead to the following topics in the information packages: EU policies, EU projects, local policies, scientific and technical information, and biomass availability and nutrient recycling.
3. The information packages are very different per region in terms of content and focus. This is due to the difference in priorities and the level of development of the selected bio-based solutions. The regional partners analysed diverse biomass streams, such as fibre crops, agri-food residues, and forestry residues, each tailored to the specific region. Additionally, while some SCALE-UP regions are focussing on practices such as composting and heat generation, which might be common place in many European countries, other regions are focusing on bio-based solutions of higher value.
4. The information packages prioritize accessibility, which is in line with the SCALE-UP principles of transparency and inclusiveness outlined in Deliverable 1.2. The translation tool is essential in enhancing the information packages' accessibility. This was concluded by the regional partners and confirmed in the feedback from the platform partners. The tool translates the articles into languages spoken in the SCALE-UP regions and makes the information accessible to local shareholders.
5. Additionally, the publication on the SCALE-UP website is important, it helps to make the information more accessible for local stakeholders. Especially the Swedish stakeholders have stressed this need. Also, this fits well to the projects' principles on transparency and inclusiveness.
6. The information packages are living documents. When, for example, information was found during the regional biomass availability assessment, relevant sources were added to the information packages. Regional partners were guided in this field. Also, the innovation support program has already led to useful information, which was added to the information packages. It is expected that this will continue over the remaining project period.

6 Recommendations

To optimize the effectiveness of the information packages, the following recommendations are given:

a) The information packages should be updated regularly to ensure that they include the latest developments, policies and scientific advancements, keeping the information relevant and useful to stakeholders. This should preferably be done by experts familiar with the relevant sector. It is also advised that the platforms take up this task in their annual activities. If necessary, protocols should be designed as how this shall be carried out within the organisation of the platforms.
b) Channels like the JRC Knowledge Centre for Bioeconomy and the links with the SCALE-UP sister projects and similar networks will be used to disseminate the information packages. Sharing of information will also be done by discussions during platform meetings, their websites, newsletters and social media platforms. If necessary, platforms will prepare communication and dissemination plans to ensure this is done effectively.
c) Stakeholders should be actively engaged and involved, ensuring that the packages meet the specific needs and priorities of the stakeholders. Close collaboration and communication with the regional platforms will also help disseminate the information packages among the stakeholders and other interested parties.
d) The information packages should be integrated and promoted across various project activities, such as the capacity-building workshops in WP3 and other events. They will also serve as basis for WP5.1 platform activities, especially on carrying out the WP2.1 recommendations, as regards to (i) scaling up the bio-economy activities, (ii) within ecological boundaries and (iii) stimulating nutrient recycling.

By implementing these recommendations, the SCALE-UP project can maximize the impact of the information packages and support the development and implementation of sustainable bio-based solutions across the six SCALE-UP project regions.

7 Annex

Contents of Annex:

- Information package: Andalusia, Spain
- Information package: French Atlantic Arc
- Information package: North Sweden
- Information package: Mazovia, Poland
- Information package: Strumica, North Macedonia
- Information package: Upper Austria

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SCALE-UP Information Package

T2.4 Review and preparation of existing scientific and technological information supporting bio-based solutions

Region:	Andalusia
Organization:	CTA (Technological Corporation of Andalusia)
Biomass stream/value chains:	Olive value chain
Bio-based solutions:	1. Biofertigation through reutilization of wastewater from olive processing (alpechin). 2. Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.

This information package aims at reviewing and collecting information relevant to the SCALE-UP project and for the regional platforms. Relevant studies should aim at supporting the bio-economy rollout in the SCALE-UP regions and of the specific bio-based solutions.

Information on the following topics will be gathered:

1. EU Policies and legislation
2. Research projects
3. Local policies
4. Technical Information on specific biobased solutions
5. Biomass availability & Nutrient recycling

1. EU Policies & Legislation

Please add the EU policies and legislation that you find relevant to the SCALE-UP project and for your bio-based solution.

Other sources of interest: JRC Knowledge Centre for Bioeconomy (English) JRC Knowledge Centre for Bioeconomy (Spanish)

List of important EU policies and legislation

	Date of adoption	Date last updated (optional)	Name	Link	Translation link (English to Spanish)	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	07-2022	12-2023	**EU Olive Oil Legislation**	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R2104		This Regulation lays down rules: (a) on the characteristics of the olive oils. (b) on specific marketing standards for the olive oils when sold to the final consumer, presented in the natural state or in a foodstuff.	The EU has established legislation defining the different categories of olive oils, the methods of analysis and the labelling and packaging rules for olive oil products. This legislation allows for a better general knowledge of the olive value chain, which is the one represented in the Andalusian region in the SCALE UP project.	To increase knowledge of the olive value chain. This legislation includes the following points: Categories of olive oil, Packaging, Labelling, Legal name and labelling of category of oils, Special storage conditions, Place of origin or Indication of the harvesting year, among others.
2	12-2019		**European Green Deal**	https://ec.europa.eu/commission/presscorner/detail/en/ip_19_6691	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/european-green-deal_en?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	European Green Deal is a set of comprehensive and integrated to transform the EU into a modern, resource-efficient and competitive economy, ensuring no net emissions of green house gases by 2050 and economic growth decoupled from reseource use.	The Green Deal includes measures in agriculture on the reduction of environmental and climate foodprint and increase of competative sustainablility from farm to fork (see below). In the energy sector the Green Deal includes measures to promote eco design of products en renewable energy from sustainable biomass resources.	"The European Green Deal is a showcase of how to transform the way we produce and consume, to achieve a healthier way of life and the creation of innovative businesses. It sets goals for securing natural heritage, biodiversity, forests and seas. Showing a sustainable and competitive character. To this end, the European Green Deal promotes the transformation of our economic model. It sets out how to reduce emissions, restore the health of our natural environment, protect our wildlife, create new economic opportunities and improve the quality of life of our citizens, through the development of various tools, projects and associated legislation.
3	01-2023		**Common Agricultural Policy (CAP) CAP 2023-27**	https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-glance_en#cap2023-27	https://agriculture-ec-europa-eu.translate.goog/common-agricultural-policy/cap-overview/cap-glance_en?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=en-US&_x_tr_pto=wapp#cap2023-27	The CAP 2023-2027 must be oriented more than ever to respond to the specific needs of the agricultural sector and rural areas in terms of equity, distribution of support, instruments and characteristics, after the serious health crisis caused by COVID. To achieve these objectives, the CAP is focusing on innovation, CAP Strategic Plans (in line with the objectives and targets of the "Green Deal"), giving the EU a greener and fairer CAP.	The CAP 2023-2027 includes "support for rural development" as one of its focal points through the development of a wide range of tools including: Funding for investment, knowledge creation, innovation and cooperation will in many cases be targeted at environmental and climate-related needs, but will also serve other CAP objectives.	Within the CAP 2023-2027, it is indicated that the improvement of existing requirements is also a necessary condition for the improvement of agricultural sustainability, for this purpose, measures are proposed to improve soil health in the long term, so farmers are required to carry out beneficial crop rotations (among other measures). On the other hand, a wide range of types of action are proposed, including ecosystems that support voluntary actions related to better nutrient management, agroecology, agroforestry, carbon farming or animal welfare (among others).

4	02-2012	01-2018	**EU bioeconomy strategy**	https://op.europa.eu/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478	https://op-europa-eu.translate.goog/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	The 2012 European Bioeconomy Strategy paved the way for a more innovative, resource-efficient and competitive society that reconciles food security with the sustainable use of renewable resources for industrial purposes, while ensuring environmental protection. A comprehensive review concluded that it has been a success, notably at mobilising research and innovation, boosting private investments, developing new value chains, promoting the uptake of national bioeconomy strategies and involving stakeholders.	The EU bioeconomy strategy aims at strenghtening and scaling-up bio-based sectors, as well as deploying local bioeconomies across Europe. Through: -The deployment of the bioeconomy will lead to the creation of jobs, especially in rural areas through the growing participation of primary producers in local bioeconomies. -The bioeconomy strategy sets as one of its main goals to support research and innovation and deployment of innovative solutions for the production of new and sustainable bio-based products. -A Strategic Deployment Agenda will be developed, which will provide a long-term vision on pathways to deploy and scale up the bioeconomy in a sustainable and circular manner. -Enhance synergies between	Relevant to the specific bio-based solutions: -It aims at increasing the availability of secondary materials (such as feed and biowaste) for further exploitation through conventional technologies (e.g. composting and anaerobic digestion) and innovative ways of extracting valuable substances. Innovation is expected to support markets for bio-based products, where one industry's waste becomes the starting material for another. -It addresses new opportunities for the forestry sector, where non-sustainable raw materials in various sectors are replaced with forestry-based materials and chemicals. -Biowaste and residues can be used as valuable resources and can help reduce food waste by 50% by 2030.
5			**European Digital Strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	The EU's digital strategy aims to make this transformation work for people and businesses, while helping to achieve its target of a climate-neutral Europe by 2050.	EU's digital strategy recognises that digital technologies are profoundly changing our world, and generate an ever-increasing amount of data, which if pooled and used properly, can lead to completely new means and levels of value creation, leading towards more sustainable solutions which are resource-efficient, circular and climate-neutral.	Real time tracking, new, added-value creations, interconnections, boosting bio-based solutions driven by new, high and/or deep technologies
6	05-2020		**Farm to Fork strategy**	https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en	https://food-ec-europa-eu.translate.goog/horizontal-topics/farm-fork-strategy_en?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=en-US&_x_tr_pto=wapp	The Farm to Fork Strategy is a set of measures to accelerate the transition to a sustainable food system that should have a neutral or positive environmental impact help to mitigate climate change and adapt to its impacts, reverse the loss of biodiversity ensure food security, nutrition and public health, making sure that everyone has access to sufficient, safe, nutritious, sustainable food preserve affordability of food while generating fairer economic returns, fostering competitiveness of the EU supply sector and promoting fair trade.	The Farm to Fork Strategy includes measures to promote sustainable food production and processing (including nutrient recycling). This includes measures on the compatativeness of the EU food supply sector including use of residues for bioproducts	
7	02-2020		**European data strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	The European data strategy aims to make the EU a leader in a data-driven society. Creating a single market for data will allow it to flow freely within the EU and across sectors for the benefit of businesses, researchers and public administrations.	The EU is creating a single market for data where data can flow within the EU and across sectors, for the benefit of all European rules, in particular privacy and data protection, as well as competition law, are fully respected the rules for access and use of data are fair, practical and clear	By having more information, consumers and users such as farmers, airlines or construction companies will be in a position to take better decisions such as buying higher quality or more sustainable products and services, thereby contributing for example to the Green Deal objectives.

2. Research Projects

Please add Interreg, Horizon 2020, Horizon Europe projects, and other projects that you find relevant to the SCALE-UP project and for your bio-based solutions.

Other sources of interest: JRC Knowledge Centre for Bioeconomy (English) | JRC Knowledge Centre for Bioeconomy (Spanish)

List of relevant projects

	Start month	End month	Name	Project website	Translation link (English to Spanish)	Project summary	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions	Activities of interest	Comments
1	1-9-2022	1-8-2025	**MainstreamBIO**	https://mainstreambio-project.eu/	https://mainstreambio--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	MainstreamBIO sets out to get small-scale bio-based solutions into mainstream practice across rural Europe, providing a broader range of rural actors with the opportunity to engage in and speed up the development of the bioeconomy. Regional Multi-actor Innovation Platforms (MIPs) will be established in 7 EU countries (PL, DK, SE, BG, ES, IE and NL) to enhance cooperation among key rural players towards co-creating sustainable business model pathways in line with regional potentials and policy initiatives.	Case study in Spain (focused on increasing awareness and promote the adoption of small-scale biobased solutions in rural areas, while also facilitating knowledge transfer and collaboration among various agents in the bioeconomy)	Innovation support services,Decision Support System, Multi-actor Innovation Platforms, Digitalisation and Practice abstracts. Some cases related with our 12 bio-based solutions (potential exchange of good practices and Knowledge)	WP4, WP5	SCALE-UP sister project
2	1-10-2022	1-9-2025	**RuralBioUp**	https://www.ruralbioup.eu/	https://www-ruralbioup-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	RuralBioUp will strengthen the cooperation among regional key actors and knowledge holders, empowering them to establish an inclusive and long-lasting ecosystem (the RuralBioUp Regional Hubs) to support the mainstreaming of bio-based business models in rural areas. In particular, RuralBioUp will establish 9 Regional Hubs in 6 EU countries, that will co-design and implement 9 Action Plans on 18 value chains.	9 regional hubs (one multi-stakeholder hub) are established in 6 EU countries (France, Romania, Czech Republic, Ireland, Latvia and Italy). 9 Action Plans will be implemented in 18 value chains.	Biomass value chain development: Biomass logistic, Valorisation, Communities. Lessons learnt	WP4, WP5	SCALE-UP sister project
3	1-9-2022	1-8-2025	**BioRural**	https://biorural.eu/	https://biorural-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	BioRural's goal is to create a European Rural Bioeconomy Network to promote small-scale bio-based solutions in rural areas and support the transition towards a sustainable, regenerative, inclusive and just circular Bioeconomy across all Europe at local and regional scale.	BioRural focusses on EU-level developments, it does not feature any regional case studies.	Rural Bioeconomy Alliance. Network. Cooperate to promote the currently available small-scale bio-based solutions		SCALE-UP sister project
4	1-6-2020	1-5-2024	**UP4HEALTH**	https://up4health.eu/	https://up4health-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=en&_x_tr_pto=wapp	The UP4HEALTH project promotes the valorisation of food by-products in order to solve industrial, economic and social problems derived from the generation of waste flows in the food industry.	The project provides a pre-industrial scale demonstration of an integrated biorefinery where the recovery of biomolecules from food processing by-products (grape pomace, olive pomace and by-products from pits and nuts) and their conversion into natural, healthy and sustainable products with high added value.	The objectives of UP4HEALTH are: Development of a biorefinery of plant waste to obtain functional ingredients from various by-products or the selection of optimized processes through modelling and eco-design tools for scaling.		The following functional ingredients are obtained in UP4HEALTH: 1. Ingredients rich in phenolic compounds: fruit water, **oil extracts** and fiber (from grape, **olive** and nut pomace) 2. 2.Xylo-oligosaccharide (XOS)
5	1-7-2021	1-6-2024	**OLEAf4VALUE**	https://oleaf4value.eu/	https://oleaf4value-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	Using the recently established 4.0 concept—the Smart Dynamic Multi-Valorisation-Route Biorefinery (SAMBIO)—OLEAF4VALUE aims to provide the basis for six smart value chains. This would enable the cascading valorisation of olive leaf biomass based on its original composition, as determined by the Biomass Suitability Index (BSI).	Case study focused on olive biomass.	This project aims to exploit the biomass from the olive leaf, which is currently under-exploited, burned in the fields, fed to livestock or, in some cases, burned to produce energy.		OLEAF4VALUE aims to establish a stable and industrial supply chain that can efficiently and economically valorize olive pruning leaves (OPL) and olive mill leaves (OML).

6	1-4-2019	1-7-2022	**BE-Rural**	https://be-rural.eu/	https://1-be--rural-eu.translate.goog/?_x_tr_enc=1&_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	BE-Rural aimed at exploring the potential of regional and local bio-based economies and support the development of bioeconomy strategies, roadmaps and business models. To this end, the project focused on establishing Open Innovation Platforms (OIPs) within selected regions in five countries: Bulgaria, Latvia, North Macedonia, Poland and Romania.		Case study in North Macedonia (focussing on Mycelium-based packaging and insulation material); Case study in Latvia (foussing on wood wool)	D5.1 "Briefing paper: Analysing market conditions and designing business models within BE-Rural's OIPs"; D5.2 "Summary report on small-scale bio-based business models and their market potentials"; D5.4 "Note on the development of a sustainability screening for regional bioeconomy strategies"	Power4Bio sister project
7	1-10-2018	1-3-2021	**POWER4BIO**	https://power4bio.eu/	https://power4bio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	POWER4BIO project aimed at empowering regional stakeholders to boost the transition towards bioeconomy regions in Europe by providing them with the necessary tools, instruments and guidance to develop and implement sound sustainable bioeconomy strategies. POWER4BIO targeted 10 regions with a focus on regions in Central and Eastern Europe.		Case study in Andalusia (focussing on Bioeconomy Strategy and Available Biomass Sources At Regional Level (Olive Biomass, Intensive Horticulture and Seaweed production))	D3.3 "Catalogue with bio-based solutions"; D6.4 "Training design and materials for increasing the bioeconomy capacity of regional stakeholders"	BE-Rural sister project; certain outputs related to the development of bio-based solutions were classified as confidential and are thus not publicly available.

Other projects

	Start month	End month	Name	Project website	Translation link (English to Spanish)	Project summary	Relevance to SCALE-UP	Comments
1	09-2022	08-2025	**ShapingBio**	https://www.shapingbio.eu/	https://www-shapingbio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	The overall aim of ShapingBio is to support and accelerate bioeconomy innovation and the deployment of new knowledge in the EU and its member states. ShapingBio aims to provide evidence-based and concrete information and recommendations for better policy alignment and stakeholder actions to realize the cross-sectoral potential of the bioeconomy and to reduce the fragmentation across bio-based sectors and food system and policies across regions, domains and governance levels.	Promote innovation in the EU bioeconomy.	ShapingBio focusses on EU macro-regions, it does not feature any rural case studies.
2	07-2022	06-2025	**BioModel4Regions**	https://www.biomodel4regions.eu/	https://www-biomodel4regions-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	BIOMODEL4REGIONS aims to support the establishment of the innovative governance models at local/regional level to achieve better-informed decision-making processes, social engagement and innovation to support and strengthen EU and international science-policy interfaces to achieve the Sustainable Development Goals.	Support regional bioeconomies.	
3	09-2022	08-2025	**CEE2ACT**	https://www.cee2act.eu/	https://www-cee2act-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	CEE2ACT will empower countries in Central Eastern Europe and beyond to develop circular bioeconomy strategies and action plans through knowledge transfer and innovative governance models enabling sustainability and resilience to achieve better informed decision-making processes, societal engagement and innovation, building on the practice of experienced countries serving as role models.	Development of bioeconomy strategies.	CEE2ACT focusses on national-level developments, it does not feature any regional/rural case studies.
4	09-2022	08-2025	**ROBIN**	https://robin-project.eu/	https://robin--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	ROBIN aims to empower Europe's regions to adapt their governance models and structures in ways that accelerate the achievement of their circular bioeconomy targets while promoting social innovation and accounting for different territorial contexts. In this context, ROBIN will support 5 regional authorities across Europe (Southern Region of Ireland, Central Macedonia, Andalusia, Baden-Wuerttemberg, Zilina) to adapt their governance models to support the scaling up of the bio-based value chains of their ecosystem.	Regional bioeconomy development, as well as social innovation in the bioeconomy, which is covered in WP5 of SCALE-UP.	
5	06-2022	05-2025	**RELIEF**	https://relief.uop.gr/	https://relief-uop-gr.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	RELIEF aims to develop and deliver an innovative approach for teaching bio-economy in farming, by developing specific learning resources addressing HEIs students and farming practitioners. RELIEF will deliver a training needs analysis and develop two curricula in bio-economy, for HE students, farming practitioners and farmers exploring the key areas that are critical for the implementation of business models and strategies towards bio-economy in farming.	Training courses on bioeconomy, also covered in WP3 of SCALE-UP.	
6	01-2021	06-2023	**COOPID**	https://coopid.eu/	https://coopid-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	Wtin COOPID, a network of bioeconomy clusters from 10 European countries has been created, involving a range of stakeholders: primary producers, in cooperatives or associations, within agriculture, forestry and aquaculture; industry; public sector; research and academia. So-called COOPID ambassadors showcased success stories, organised workshops and conducted interactive dissemination and communication campaigns. The focus was on the uptake of sustainable bio-based business models in the primary production sector.	Development of bioeconomy clusters.	D4.2 "Success story factors for biobased Business models"
7	12-2022	11-2026	**P2GreeN**	https://p2green.eu/	https://p2green-eu.transla	P2GreeN will implement and demonstrate innovative N & P recovery solutions based on human sanitary waste from urban settlements and its conversion into safe bio-based fertilisers for agricultural production. The project will test the solutions in three pilot regions on a north-south trajectory.	Nutrient recovery is a part of SCALE-UP.	

3. Regional, National & Local policies

Please add the local policies (including strategies, roadmaps, incentives, subsidy schemes and regulatory information) that you find relevant to the SCALE-UP project and to your bio-based solutions. Please also look into your country's CAP Strategic Plans and see whether this is relevant to you.

List of relevant policies

	Year	Regional/Provincial/National	Title	Title (original language)	Link	Translation link (Spanish -> English)	Author/Publisher:	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions	Comments
1	2022	National	Law 7/2022 of 8 April on waste and contaminated soils for a circular economy.	Ley 7/2022, de 8 de abril, de residuos y suelos contaminados para una economía circular.	https://www.boe.es/buscar/doc.php?id=BOE-A-2022-5809	https://www-boe-es.translate.goog/buscar/doc.php?id=BOE-A-2022-5809&_x_tr_sl=es&_x_tr_tl=nl&_x_tr_hl=en-US&_x_tr_pto=wapp	Government of Spain (Ministry of the Presidency, Relations with the Courts and Democratic Memory) State Agency (Official State Gazette)	The Law aims to establish the principles of the circular economy through basic legislation on waste, as well as contributing to the fight against climate change and protecting the marine environment.	This law is important because it seeks to promote an efficient use of resources, with a firm strategic commitment from all public administrations, as well as to achieve the joint involvement and commitment of the economic and social agents that are essential for regional scaling up.	This law includes by-products, in our case biochemical compounds resulting from olive processing activities, and differentiates them from waste, considering them as substances resulting from a production process that can be used without undergoing further processing other than normal industrial practice.	
2	2018	Regional	Andalusia's Circular Bioeconomy Strategy	Estrategia Andaluza de Bioeconomía Circular	https://www.juntadeandalucia.es/export/drupalida/Estrategia_Andaluza_Bioeconomia_Circular_EABC_18.09.2018.pdf ; https://www.juntadeandalucia.es/organismos/transparencia/planificacion-evaluacion-estadistica/planes/detalle/155202.html#toc-documentos-del-plan	https://www-juntadeandalucia-es.translate.goog/organismos/transparencia/planificacion-evaluacion-estadistica/planes/detalle/155202.html?_x_tr_sl=es&_x_tr_tl=nl&_x_tr_hl=en-US&_x_tr_pto=wapp#toc-documentos-del-plan	Junta de Andalucía	The general objective of the Andalusian Circular Bioeconomy Strategy is: To contribute to the growth and sustainable development of Andalusia by promoting actions aimed at fostering the production of renewable biological resources and processes. The achievement of this general objective involves giving continuity to and reinforcing those actions that are currently being developed to sustainably produce renewable biological resources and processes and, at the same time, promoting new actions that need support, mainly public, which in the medium to long term will act as a driving force for change in the Andalusian economy, giving way to a model based on the bioeconomy.	The Andalusian Circular Bioeconomy Strategy focuses on the set of activities that make up the three basic segments that make up the value chains of bioproducts and bioenergy in a framework of sustainable use of resources, specifically, the production of biomass, its technological processing and the consumer markets for the bioproducts obtained.	The Andalusian Circular Bioeconomy Strategy is based on the following strategic objectives that directly benefit the olive value chain: 1. Increasing the availability of sustainable biomass for use through innovative treatments. 2. Increase in the volume of bioindustries and biorefineries in Andalusia. 3. Increased markets and consumption of bioproducts and bioenergy in Andalusia. So all three objectives coincide with our bio-based solutions.	Period of validity: 19/09/2018 - 31/12/2030
3	2015	Regional	MASTER PLAN FOR THE ANDALUSIAN OLIVE GROVE	PLAN DIRECTOR DEL OLIVAR ANDALUZ	https://www.juntadeandalucia.es/export/drupalida/Plan%20Director%20del%20Olivar.pdf	-	Junta de Andalucía (Regional Ministry of Agriculture, Fisheries and Rural Development)	The public authorities must take action to promote the sustainable development of olive-growing areas, since, apart from olive growing itself, it is important to note the decisive importance, both socially and economically, of the processing and distribution of olive products, including by-products, which are the main activity of many Andalusian villages. For this reason, together with the intervention of the public authorities, actions emanating from the private sector and civil society should be considered so that a common commitment and a desirable synergy between actors and territories can be achieved in order to ensure proper governance in olive-growing regions.	The Master Plan for the Andalusian olive grove promotes an economy capable of making efficient use of resources, greener and more competitive and an inclusive growth with a high level of employment and high social and territorial cohesion essential for scaling up. Outlines the strategy of the Olive Sector towards a competitive and sustainable olive sector. This plan can be seen as a basis for a more specific bioeconomy and circular economy strategy. Created by the olive sector, it is still a singlesector plan, but it involves different measures to increase the utilization of by-products from the current olive biorefinery complex. In fact, many SME's active in extracting new products from the olive are from the olive sector and could contribute to creating a bridge towards the chemicals sector.	This plan sets out the outline of the agents in the olive value chain and the vertical and horizontal relationships. For example, relations between farms and mills, and between mills and packers-refineries, establishing flows of goods, finance and information, which circulate in both directions and allow us to have a clearer idea of the phases in which bio-based solutions can be incorporated.	
4	2020	National	Spanish Circular Economy Strategy	Estrategia Española de Economía Circular	https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/estrategia/ ; https://www.miteco.gob.es/es/calidad-y-evaluacion-ambiental/temas/economia-circular/espanacircular2030_def1_tcm30-509532_mod_tcm30-509532.pdf	-	Ministry for the ecological transition and the demographic challenge	The Spanish Circular Economy Strategy, Spain Circular 2030, lays the foundations for promoting a new model of production and consumption in which the value of products, materials and resources is maintained in the economy for as long as possible, in which the generation of waste is minimised and those that cannot be avoided are used to the greatest possible extent. The Strategy thus contributes to Spain's efforts to achieve a sustainable, decarbonised, resource-efficient and competitive economy. This strategy will be materialised through successive three-year action plans. The strategic principles and guidelines are designed to comply with Article 45 of the Spanish Constitution.	The strategy ties in with the main recent international initiatives to safeguard a healthy environment: the Paris Agreement on climate change, the 2030 Agenda for Sustainable Development, and the Ministerial Declaration of the United Nations Environment Assembly "Towards a pollution-free planet", agreed in December 2017 in Nairobi. It is also consistent with the lines of action promoted within the framework of the European Union, such as the European Green Pact and the European Commission's two plans in this area, making it an essential strategy for scaling up in the region.	Targets include improving water use efficiency by 10%, increasing resource reuse and reducing food waste generation, therefore these measures apply directly to our bio-based solutions 1 and 2 respectively.	The Strategy has a long-term vision, Spain Circular 2030, which will be achieved through successive three-year action plans to be developed, which will incorporate the necessary adjustments to complete the transition by 2030.
5	2018	National	The Spanish Bioeconomy Strategy	Estrategia Española de Bioeconomía	https://knowledge4policy.ec.europa.eu/publication/spanish-bioeconomy-strategy-2030-horizon_en ; https://bioeconomia.chil.me/download-doc/102159	https://knowledge4policy-ec-europa-eu.translate.goog/publication/spanish-bioeconomy-strategy-2030-horizon_en?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Ministry of Economy and Competitiveness. State Secretariat for Research, Development and Innovation	Spanish Bioeconomy Strategy is presented with the objective by 2030 of achieve more innovative, more competitive and more efficient companies, and a more diversified and environmentally more sustainable economy, advancing in the transition toward a circular economy.	The Bioeconomy strategy is designed to encourage economic activity and improve the competitiveness and sustainability of productive sectors linked to the use of resources whose base is biological.	A important activities included in this strategy and linked to the agroforestry sector relates to the extraction and transformation of timber, cork, resin, production of paper and of other industrial products, and extracting bioenergy and other bioproducts, uses and services linked to ecosystems, ranging from harvesting activities to final product. These productive processes, with great potential for generating employment and added value, involve major amounts of biomass associated with our Bio-based solutions 1 and 2.	
6	2019	EU Community	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 2003/2003	Reglamento (UE) 2019/1009 del Parlamento Europeo y del Consejo, de 5 de junio de 2019, por el que se establecen disposiciones relativas a la comercialización de los productos fertilizantes UE.	https://www.boe.es/buscar/doc.php?id=DOUE-L-2019-81081 ; https://eur-lex.europa.eu/legal-content/en/TXT/?uri=CELEX%3A32019R1009	https://www-boe-es.translate.goog/buscar/doc.php?id=DOUE-L-2019-81081&_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION	The Regulation is composed of the following Chapters: I) General provisions; II) Obligations of economic operators; III) Conformity of EU fertilising products; IV) Notification of conformity assessment bodies; V) Union market surveillance, control of EU fertilising products entering the Union market and Union safeguard procedure; VI) Delegated powers and Committee procedure; VII) Amendments; VIII) Transitional and final provisions.	This Regulation brings together a series of articles containing information on the nutrients that are part of the fertiliser (EC fertiliser), the traceability of the nutrients, labelling rules, packaging rules and the declaration of secondary nutrients in primary nutrient fertilisers.	This regulation is essential to know the technical characteristics that fertilisers must have and therefore the use we can make of them in biofertigation.	

7	2023	Regional	Andalusian Biodiversity Strategy Horizon 2030	Estrategia Andaluza de Biodiversidad Horizonte 2030	https://www.juntadeandalucia.es/boja/2023/33/1#:~:text=La%20EAB%202030%20tiene%20como,la%20ciudadan%C3%ADa%2C%20la%20participaci%C3%B3n%20y	https://www-juntadeandalucia-es.translate.goog/boja/2023/33/1?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp#:~:text=La%20EAB%202030%20tiene%20como,la%20ciudadan%C3%ADa%2C%20la%20participaci%C3%B3n%20y	Junta de Andalucía (Ministry of Sustainability, Environment and Blue Economy)	The EAB 2030 aims to establish a strategic framework to guarantee the conservation and sustainable use of biological diversity in Andalusia, based on key aspects such as the reinforcement of intersectoral coordination, inter-territorial cooperation, citizen involvement, participation and co-responsibility of social actors, responding to the commitments set out in our international, state and European spheres related to biodiversity management.	The general objective of this strategy is to conserve Andalusia's biodiversity and improve management to achieve the proper functioning of its ecosystems, promoting scaling up in this sector.	Given that it intends to improve management to achieve the proper functioning of ecosystems, it would help to improve the processes associated with the olive grove value chain and our recovery options (Biofertigation through reuse of wastewater from olive processing and Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	
8	2022	Regional	Integral Plan for Waste Plan of Andalusia	Plan Integral de Residuos de Andalucía	https://www.juntadeandalucia.es/medioambiente/portal/documents/20151/26992369/2021_10_19_PIRec_completo5.pdf/6c1a646a-c293-79ca-c201-a913386b86ce?t=1634807843024	-	Junta de Andalucía	The Andalusian Integrated Waste Plan. Towards a Circular Economy in the 2030 Horizon (PIRec 2030) was drawn up due to the need to revise the waste plans in force in order, on the one hand, to update their prevention, recycling, recovery and disposal objectives to the new European and state objectives, and on the other hand, to adapt their structure, contents, periods of validity, and frequency of evaluation and revision to the provisions of the State Waste Framework Plan and the new European guidelines. On the other hand, it arises at a time to reinforce and accelerate Andalusia's transition towards a circular economy, to boost competitiveness, create employment and generate sustainable growth	This plan includes European, national and regional regulations on the use of industrial oils and agricultural waste, which are important to take into account for the circular economy and the olive value chain.	It is relevant because it shows the evolution of plant tissue waste generation in Andalusia and the provincial distribution of waste biomass generation. It can therefore serve as an indicator of the areas where there is more residual biomass available for reintroduction into the value chain to produce biofertilisers and cosmetics.	
9	2023	Regional	Network of Protected Natural Areas of Andalusia (RENPA)	Red de Espacios Naturales Protegidos de Andalucía (RENPA)	https://www.juntadeandalucia.es/medioambiente/portal/web/guest/areas-tematicas/espacios-protegidos/configuracion-renpa/superficie-red-espacios-naturales-protegidos-andalucia	https://www-juntadeandalucia-es.translate.goog/medioambiente/portal/areas-tematicas/espacios-protegidos/configuracion-renpa/superficie-red-espacios-naturales-protegidos-andalucia?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Junta de Andalucía (Ministry of Sustainability, Environment and Blue Economy)	In Andalusia, Rediam (Andalusian Environmental Information Network) is responsible for integrating and disseminating all the information generated by the different production centers, both public and private. At the same time, Rediam constitutes another center for the production and updating of numerous information on environmental issues. Anyone can access information on the environment. This right is guaranteed by Law 27/2006, of July 18.	The total area of RENPA is 2,918,582.04 hectares: Land surface: 2,836,400.24 hectares Marine surface: 82,181.80 hectares Some of these hectares have olive groves from our value chain under study.	Knowing the protected area is very important for our biological-based solution, since we could control the amount of biofertigation to apply in these areas through the reuse of wastewater from olive processing, thus achieving circular recycling.	
10	2018	EU Community	DIRECTIVE (EU) 2018/2001 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 on the promotion of the use of energy from renewable sources	Directiva (UE) 2018/2001 del Parlamento Europeo y del Consejo, de 11 de diciembre de 2018, relativa al fomento del uso de energía procedente de fuentes renovables (versión refundida sobre la directiva 2009/28/EC)	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02018L2001-20181221	https://eur--lex-europa-eu.translate.goog/legal-content/EN/TXT/?uri=CELEX:02018L2001-20181221&_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	European Parliament and EU Council.	In accordance with Article 194(1) of the Treaty on the Functioning of the European Union (TFEU), the promotion of renewable energy sources is one of the objectives of the Union's energy policy. This directive pursues that objective. The increased use of energy from renewable sources or renewable energy is an important part of the package of measures needed to reduce greenhouse gas emissions and to comply with the 2015 Paris Agreement on Climate Change.	It establishes sustainability and greenhouse gas emissions saving criteria for biofuels, bioliquids and biomass fuels.	When developing support schemes for renewable sources of energy, Member States should consider the available sustainable supply of biomass and take due account of the principles of the circular economy and of the waste hierarchy established in Directive 2008/98/EC in order to avoid unnecessary distortions of raw materials markets. Waste prevention and recycling of waste should be the priority option.	
11	2006	EU Community	COMMISSION REGULATION (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs	Reglamento (CE) no 1881/2006 de la Comisión, de 19 de diciembre de 2006, por el que se fija el contenido máximo de determinados contaminantes en los productos alimenticios	https://eur-lex.europa.eu/legal-content/ES/TXT/?uri=CELEX:02006R1881-20191128	https://eur--lex-europa-eu.translate.goog/legal-content/ES/TXT/?uri=CELEX:02006R1881-20191128&_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	European Parliament and EU Council.	Sets maximum levels for certain contaminants in foodstuffs.	In the framework of Directive 93/5/EEC, a specific SCOOP-task 'Collection of occurrence data on PAH in food' has been performed in 2004(37). High levels were found in dried fruits, olive pomace oil, smoked fish, grape seed oil, smoked meat products, fresh molluscs, spices/sauces and condiments.	It is important to promote the use of residues from oil production and to valorise those organic components present in olive pomace oil that are harmful to health.	
12	2015	EU Community	Commission Regulation (EU) 2015/2002 amending Annexes IC and V to Regulation (EC) No. 1013/2006 of the European Parliament and of the Council on shipments of waste.	Reglamento (UE) 2015/2002 de la Comisión, de 10 de noviembre de 2015, por el que se modifican los anexos IC y V del Reglamento (CE) n° 1013/2006 del Parlamento Europeo y del Consejo, relativo a los traslados de residuos (Texto pertinente a efectos del EEE)	https://eur-lex.europa.eu/legal-content/ES/TXT/PDF/?uri=CELEX:32016R1245&from=EN	-	European Commission.	On 28.07.2016, the Commission adopted an implementing act establishing a preliminary correlation table between customs and waste codes. This correlation table is intended to enhance the implementation of the Waste Shipment Regulation by making it easier for customs officials to identify potential waste streams. This regulation is in line with the additional measures foreseen by the Commission in its Circular Economy Action Plan.	One of the issues identified is the difficulty that the partners have in transporting waste from oil production and olive pruning, and the need for a regulation governing the transport and management of these products.	The knowledge of the current legislation on waste shipment and after identifying its weak points for the purpose of promoting the recycling of by-products such as those of the olive value chain, it will be possible to identify new needs and improvements that this law may require to be more in line with a sustainable economy.	

CAP Strategic Plans

	Year	Regional/Provincial/National	Title	Title (original language)	Link	Author/Publisher:	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions	Comments

1	2021	National	Plan Estratégico de la PAC de España	Spain's Strategic Plan for the CAP	https://www.mapa.gob.es/es/pac/post-2020/pepac-sfc2021-v12_tcm30-623871.pdf ; https://www.mapa.gob.es/es/pac/post-2020/plan-estrategico-pac.aspx	https://www-mapa-gob-es.translate.goog/es/pac/pac-2023-2027/?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Ministry of Agriculture, Fisheries and Food	It is a very complete document that includes the interventions or measures that will be applied in 2023-2027 to respond to the needs of the Spanish countryside and thus achieve the objectives of the CAP and the ambition of the European Green Pact. With the reform of the CAP 2023-2027, a new approach is established whereby Member States must set out the details of the interventions or measures of the new CAP, through a strategic plan. For the first time, there is a single strategy covering all CAP interventions, which implies greater coherence between them. In addition, this reform has given greater flexibility to adapt CAP measures to national and regional specificities.	It includes a diagnosis and analysis of the needs of the agricultural sector and the rural environment as a whole, linked to each of the CAP objectives. This analysis took into account aspects as varied as the agricultural, economic, social and environmental conditions in Spain necessary for scaling up. In Addition, this plan favours integration in associative entities and the creation of economies of scale, increases the economic dimension of the holdings and reduces the atomisation of production sectors such as the olive grove.	Establishes the intervention logic for the replanting of plantations or olive groves when plantations or olive groves when necessary. This factor is important for the use of biofertigation in plantations.	It will apply from 2023 to 2027
2	2017	National	Proposal for a Spanish position on the European Commission's initiative on "Modernisation and simplification of the CAP" (CAP Reform: Spanish position).	Propuesta de posición española en relación con la iniciativa de la Comisión Europea sobre "Modernización y simplificación de la PAC" (Reforma PAC: postura española).	https://preservicio.mapama.gob.es/en/agricultura/temas/pac/postura-reforma-pac/default.aspx https://www.mapa.gob.es/es/pac/historia-pac/	https://preservicio-mapama-gob-es.translate.goog/en/agricultura/temas/pac/postura-reforma-pac/default.aspx?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp ; https://www-mapa-gob-es.translate.goog/es/pac/historia-pac/?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Ministry of Agriculture, Fisheries and Food	At the beginning of 2017, the European Commission launched a public consultation for a new CAP reform with the intention of establishing the Spanish position. On 27 and 28 March 2017, a Conference "Building the CAP of the future" was held, open to all agents in the sector and Autonomous Communities. As a result of the comments received, a proposal for a Spanish position was drawn up in relation to the European Commission's initiative on "Modernisation and simplification of the CAP". This proposal was presented and discussed at the Sectoral Conference on Agriculture and Rural Development held on 24 April 2017, where a common position was reached.	There continues to be a broad international consensus on the challenges facing agriculture in the coming decades, in particular the challenge of food security, due to the expected increase in world population and consumption, which in turn will make it necessary to address the challenge of preserving the environment and combating climate change, producing more food with fewer resources through the recycling of nutrients in value chains.	In this Spanish position, emphasis is placed on maintaining specific support programmes for fruit (including olives in our value chain) in order to reinforce the quality and added value of production. In addition, the direct CAP payments received by farmers and livestock farmers are boosted, thus constituting essential tools to face new challenges (biofertigation, extraction of biochemical compounds, etc.).	

4. Technical information on specific bio-based solutions

Please add technical information, including scientific information, peer-reviewed articles, reports, and other data or research that you find relevant to the bio-based solutions.

List of relevant technical information

Solution 1: Biofertigation through reutilization of wastewater from olive processing (alpechin).

Solution 2: Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.

Solution 3: Both

	Date	Author(s)	Title	Link	Translation link (English -> Spanish)	Organizations	Summary of contents	Relevant to which solution?	Why is it relevant?
1	2021	Ministry of Agriculture, Livestock, Fisheries and Sustainable Development General Directorate of Natural Environment, Biodiversity and Protected Areas	**Methodology applied to calculate the RENPA surface**	https://www.juntadeandalucia.es/medioambiente/portal/areas-tematicas/espacios-protegidos/configuracion-renpa/superficie-red-espacios-naturales-protegidos-andalucia	https://www-juntadeandalucia-es.translate.goog/medioambiente/portal/areas-tematicas/espacios-protegidos/configuracion-renpa/superficie-red-espacios-naturales-protegidos-andalucia?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	Junta de Andalucía	The RENPA Coordination and Management Service has updated the methodology to obtain the total area of the RENPA. To obtain this methodology, the ESRI ArcMap 10.2.1 GIS software has been used. In addition, the Transverse Mercator projection, ETRS 1989 UTM Zone 30N coordinate system, was used.	Biofertigation through reutilization of wastewater from olive processing (alpechin).	Knowing the metodology of protected areas is very important for our biological-based solution, since we could control the amount of biofertigation to apply in these protected areas.
2	2020	Andalusian Energy Agency (Department of Finance, Industry and Energy)	**Bioenergy in Andalusia**	https://www.agenciaandaluzadelaenergia.es/es/biblioteca/la-bioenergia-en-andalucia	https://www-agenciaandaluzadelaenergia-es.translate.goog/es/biblioteca/la-bioenergia-en-andalucia?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	Andalusian Energy Agency (Department of Finance, Industry and Energy)	Situation of bioenergy in Andalusia. Main biomasses of Andalusia. Implementation of biomass and existing potential in Andalusia. biomass applications. The business sector. Future's expectations.	Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	Knowing the existing biomass potential in Andalusia helps to know what percentage of bioactive compounds can be reused in the value chain.
3	2010	Junta de Andalucía (Ministry of Agriculture and Fisheries)	**ENERGY POTENTIAL OF THE BY-PRODUCTS OF THE OLIVE INDUSTRY IN ANDALUSIA**	https://www.juntadeandalucia.es/export/drupaljda/Potencial%20energ%C3%A9tico.pdf	https://www.juntadeandalucia.es/export/drupaljda/Potencial%20energ%C3%A9tico.pdf	Junta de Andalucía (Ministry of Agriculture and Fisheries)	Agro-industries of the olive grove and by-products with energy use derived from them and general information on the by-products of the industries of the olive sector	Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	Detailed description of the residues and solid by-products derived from the processing of olives. It is important to distinguish the different types of biomass originated during olive processing and to have a vision of the bioactive compounds that can be extracted from it.
4	2022	Magdalena Soledad Cifuentes Cabezas	**Recovery of polyphenols from olive mill effluents by membrane processes and biological treatment of reject streams**	https://riunet.upv.es/bitstream/handle/10251/191508/Cifuentes%20-%20Recuperacion%20de%20polifenoles%20de%20efluentes%20de%20almazara%20mediante%20procesos%20de%20membrana%20y%20....pdf?sequence=1	-	University of Valencia	Description of olive oil and table olive production, description of olive mill and table olive wastewater, wastewater management, membrane processes, adsorption/desorption processes, biological treatment, hybrid processes, ultrafiltration technique, nanofiltration, direct osmosis, adsorption/desorption with resins and characterisation of samples.	Both	This thesis is very relevant because it shows the techniques for the recovery of non-essential organic nutrients from olive mill effluents.
5	2016	Consultants- CIRCLE	**Andalusia as a model demonstrator region**	https://www.juntadeandalucia.es/export/drupaljda/IRA_Andalusia_english.pdf	-	Consultants-CIRCLE	This document is an assessment of the investment readiness of the region of Andalusia concerning investments in the area of Sustainable Chemicals. Sustainable Chemicals are defined as new chemical processes that use either biomass (agriculture and forestry), waste streams (organic waste streams and plastic waste) or CO2 as feedstock.	Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	Having sufficient alternative feedstocks available, a critical mass of chemical industry and also reasonable investment in biobased production, Andalusia is well positioned to further engage in sustainable production using biomass and waste.
6	2021	Jesús Marquina, María José Colinet and María del P. Pablo-Romero	**Measures to Promote Olive Grove Biomass in Spain and Andalusia: An Opportunity for Economic Recovery against COVID-19**	https://www.mdpi.com/2071-1050/13/20/11318	https://www-mdpi-com.translate.goog/2071-1050/13/20/11318?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	University of Seville	Olive grove biomass presents an opportunity to reduce greenhouse gases and meet the sustainability objectives set by Europe. Given the relevance of this organic matter, this paper analyzes the evolution and current situation of the regulations that regulate olive grove biomass as a source of energy in Europe, in Spain and in Andalusia.	Both	The results of this paper can be divided into three parts. In each of them, the main regulations and energy plans, approved in Europe, in Spain and in Andalusia, are analyzed. This highlights what effects the policies have had on the development of olive grove biomass, and what opportunities for increased waste usage would mTean for the economic recovery after COVID-19.
7	2019	Antonio Alberto Rodríguez Sousa, Jesús M. Barandica and Alejandro Rescia	**Ecological and Economic Sustainability in Olive Groves with Different Irrigation Management and Levels of Erosion: A Case Study**	https://www.mdpi.com/2071-1050/11/17/4681	https://www-mdpi-com.translate.goog/2071-1050/11/17/4681?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	Complutense University of Madrid	In this study, in an olive-growing region of Andalusia, Spain, the variation of several soil parameters related to irrigation and erosion levels was analysed. The results showed that irrigation, while increasing the productive level of the olive groves, entails a progressive alteration of the soil, modifying physical aspects (greater compaction and humidity of the soil together with lower gravel content, porosity and soil weight) and chemical aspects (reduction of the organic matter of the soil and the content of nitrates) that can aggravate the consequences of the erosive processes. In the long term, the productive benefit attributed to irrigation could be unsustainable from an ecological and, consequently, economic point of view.	Biofertigation through reutilization of wastewater from olive processing (alpechin).	In the long term, the productive benefit attributed to irrigation could be unsustainable from an ecological and, consequently, economic point of view. In addition, the lack of sustainability of olive irrigation agroecosystems could be exacerbated by the future restrictive impacts of climate change on water resources in Mediterranean environments.

8	2018	Antonio López-Pintor 1, Javier Sanz-Cañada 2, Ernesto Salas 3 and Alejandro J. Rescia	**Assessment of Agri-Environmental Externalities in Spanish Socio-Ecological Landscapes of Olive Groves**	https://www.mdpi.com/2071-1050/10/8/2640	https://www-mdpi-com.translate.goog/2071-1050/10/8/2640?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	Complutense University of Madrid	Traditional agricultural systems and their spatial context constitute socio-ecological landscapes for their long co-evolutionary history. However, these systems not only generate positive but also negative agri-environmental externalities, such as soil erosion, diffuse pollution and potential wild biodiversity degradation. In this paper, it presents a methodological approach for developing and testing indicators to estimate the effects of these externalities, especially designed to be used to help guide land-use policy changes. The Spanish socio-ecological landscape of olive groves, due to its extent, economic importance, cultural and social values, and data available, constitutes a paradigmatic case study in which to define and test the performance of indicators for these environmental externalities.	Biofertigation through reutilization of wastewater from olive processing (alpechín).	Indicators play an essential role in objectively assessing actions and processes involved in the ecological, economic, and social aspects of sustainable agriculture. Available indicators allow the farmers to contrast their farming practices related to nutrient balances and biofertirrigation, energy efficiency or productivity.
9	2020	Clara Castillo López- María Pilar Quesada	**Olive tree and by-products R&D&I**	https://www.um.es/documents/2918258/18875715/Escrita_CyT_IES+San+Juan+de+la+Cruz.pdf/be906405-eb64-4cc8-baf0-0db1645ddce1	-	IES San Juan de la Cruz	The aim of this article is to: To learn about olive cultivation in Spain over 100 years, to study how a traditional and modern olive mill works, to study the relationship between olive oil and human health, to learn about the by-products of olive oil processing, to study the use of olive oil processing waste and to study the use of olive grove by-products as a benefit to the environment.	Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	Olive oil and table olives are not the only products we can obtain from the olive tree. With olive oil we can obtain cosmetic and food products and also make use of many by-products (pomace, olive pomace, olive pits and olive pruning branches), some of which have not been known to date: use as biofuel, for example. Through the use of appropriate technology we can obtain, from olive by-products thermal energy, electrical energy and even bioethanol from olive by-products.
10	2016	Ministry of Agriculture, Fisheries and Food	**Olive oil**	https://www.mapa.gob.es/es/agricultura/temas/producciones-agricolas/aceite-oliva-y-aceituna-mesa/aceite.aspx#cd-search	https://www-mapa-gob-es.translate.goog/es/agricultura/temas/producciones-agricolas/aceite-oliva-y-aceituna-mesa/aceite.aspx?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp#cd-search	Ministry of Agriculture, Fisheries and Food	Spain is a world leader in surface area, production and foreign trade thanks to our country's olive-growing tradition and a technologically advanced and professional industry capable of obtaining high quality oils. Spanish olive oil production accounts for 70% of EU production and 45% of world production. At regional level, olive oil production is located in Andalusia with 80% of the total, where Jaén is the main producing province with approximately 37% of the total, followed by Castilla La Mancha with 8% and Extremadura with 4% of the national total. The processes of transformation and distribution of its production, including its by-products, constitute the main activity of numerous municipalities and an associated industry which, in many cases, provides backbone and cohesion to the rural environment in which it is based, supported by a strong grassroots cooperative movement.	Both	It is relevant because it describes the olive sector in Spain, the surface area and production, details of foreign trade and the market situation of the olive grove
11	2023	Andalusian Energy Agency (Andalusian Ministry of Industrial Policy and Energy)	**Map of biomass resources and installations in Andalusia**	https://www.agenciaandaluzadelaenergia.es/es/informacion-energetica/cartografia-energetica-de-andalucia/recursos-y-potencial-de-energias-renovables/mapa-de-recurso-e-instalaciones-de-biomasa-en-andalucia	https://www.agenciaandaluzadelaenergia.es/es/informacion-energetica/cartografia-energetica-de-andalucia/recursos-y-potencial-de-energias-renovables/mapa-de-recurso-e-instalaciones-de-biomasa-en-andalucia	Andalusian Energy Agency (Andalusian Ministry of Industrial Policy and Energy)	The map of biomass resources and installations in Andalusia includes, on the one hand, a biomass potential in Andalusia that includes updated and extended information on the potential of this energy resource and, on the other hand, a map of biomass resources and installations in Andalusia that includes, on the other hand, a biomass potential in Andalusia that includes updated information on the potential of this energy resource, analysing sectors not previously studied and updating the biomass production ratios as a result of the application of the information obtained in the biomass field.	Both	In the tool there are functionalities common to both, such as information by municipality, where a single search shows all the information regarding potential and existing installations in a selected municipality; and functionalities specific to each application, such as the search for biomass in a given quantity and the search for installations in a given location.
12	2015	Ministry of Agriculture, Fisheries and Food	**PLAN DIRECTOR DEL OLIVAR ANDALUZ.**	https://www.juntadeandalucia.es/organismos/transparencia/planificacion-evaluacion-estadistica/planes/detalle/59239.html	https://www-juntadeandalucia-es.translate.goog/organismos/transparencia/planificacion-evaluacion-estadistica/planes/detalle/59239.html?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=en-US&_x_tr_pto=wapp	Junta de Andalucía	The "Plan Director del Olivar Andaluz" was approved by Decree 103/2015 of March 10. It is provided for in the Andalusian Olive Grove Law and includes four major blocks: farms; industries and markets; training and R+D+i, and improvement of the management of olive grove territories. Its development focused on the regions where the production of olives or olive oil is fundamental for the economy, employment, the maintenance of the population and the conservation of the landscape and natural heritage.	Both	This plan established its horizon for 2020 and envisaged measures to ensure the competitiveness, sustainability and global leadership of Andalusia in this strategic sector, which provides 35% of agricultural employment and is the main economic activity in more than 350 Andalusian municipalities.
13	2020	Adnan Khdair and Ghaida Abu-Rumman	**Sustainable Environmental Management and Valorization Options for Olive Mill Byproducts in the Middle East and North Africa (MENA) Region**	https://www.researchgate.net/publication/341944295_Sustainable_Environmental_Management_and_Valorization_Options_for_Olive_Mill_Byproducts_in_the_Middle_East_and_North_Africa_MENA_Region		Jordan University of Science and Technology	OMWW has a potential economic value that remains to be utilized such as: fertilizers, valuable antioxidant agents and fatty acids needed in human diet. Also,Olive pomace is a valuable renewable energy source and has become an inexpensive alternative for fossil fuels. Aiming at adding value to the olive production sectors and potential valorization options for by-products in the region of study, international practices applied in olive mills wastes management's and treatment methods used in major oil producing countries are presented.	Both	It is relevant because it describes the potential economic value of OMWW to be used as fertilizers, valuable antioxidant agents and aims to add value to olive production and options for by-product valorization (among others).

5. Biomass availability studies and nutrient recycling

Please add biomass availability and nutrient recycling studies that you find of interest to the deployment of your bio-based solutions.

List of relevant studies

Solution 1: Biofertigation through reutilization of wastewater from olive processing (alpechin).

Solution 2: Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.

Solution 3: Both

	Year	Author(s)	Title	Link	Translation link (English -> Spanish)	Summary of contents	Relevant to which solution?	Why is it relevant?
1	2004	Alburquerque, J., Gonzálvez, J., García, D., & Cegarra, J.	Agrochemical characterisation of "alperujo", a solid by-product of the two-phase centrifugation method for olive oil extraction.	https://doi.org/10.1016/S0960-8524(03)00177-9		This study allows a better understanding of the agrochemical characterization of "alperujo" (AL) and the determination of these properties as not compatible with agricultural requirements, so composting is considered the most suitable alternative for its disposal. In this sense, this study indicates the need to characterize AL prior to composting.	Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	Improved knowledge of the agrochemical characterization of "alperujo" (AL) and the characteristics of alperujo when used as compost.
2	2008	Mariann Garner-Wizard, Jennifer Minigh, Shari Henson, Heather S Olive, Brenda Milot, Marissa Oppe	Olive Oil's Active Components and Benefits	http://cms.herbalgram.org/herbclip/357/review010687-357.html?ts=1679475074&signature=1a550421a33c914a6c16bd4054b4cd59&ts=1680028237&signature=732d566eaf042d19c21690622798c7ad		Olive (Olea europaea) oil is a major component of the Mediterranean diet, which is associated with a reduced risk for chronic diseases including heart disease and cancer. Research suggests that the type of fat consumed "is more important than the total amount consumed." The relatively high levels of monounsaturated fatty acids (MUFA) and antioxidants found in olive oil, the main energy source in the Mediterranean diet, may be at least partially responsible for its protective effect against degenerative diseases.	Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	The evidence indicate that olive oil and its components contribute significantly to the health benefits of the Mediterranean diet, with more of an effect on prevention than treatment.
3	2018	Lucía Olmo-García,Nikolas Kessler,Heiko Neuweger,Karin Wendt,José María Olmo-Peinado ,Alberto Fernández-Gutiérrez, Carsten Baessmann and Alegría Carrasco-Pancorbo.	Unravelling the Distribution of Secondary Metabolites in Olea europaea L.: Exhaustive Characterization of Eight Olive-Tree Derived Matrices by Complementary Platforms (LC-ESI/APCI-MS and GC-APCI-MS)	https://www.mdpi.com/1420-3049/23/10/2419	https://www-mdpi-com.translate.goog/1420-3049/23/10/2419?_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=nl&_x_tr_pto=wapp	In order to understand the distribution of the main secondary metabolites found in Olea europaea L., eight different samples (olive leaf, stem, seed, fruit skin and pulp, as well as virgin olive oil, olive oil obtained from stoned and dehydrated fruits and olive seed oil) coming from a Picudo cv. olive tree were analyzed. The identified metabolites belonged to different chemical classes: triterpenic acids and dialcohols, tocopherols, sterols, free fatty acids, and several sub-types of phenolic compounds being the latter, more abundant in tissues, as well as the glycosylated flavonoids (predominantly distributed between leaves and stems).	Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	It allows to understand the amount and type of secondary metabolites present in the olive tree to be taken into account in the extraction of biochemical compounds.
4	2013	Sánchez-Quesada, C.; López-Biedma, A.; Warleta, F.; Campos, M.; Beltrán, G.; Gaforio, J.J	Bioactive properties of the main triterpenes found in olives, virgin olive oil, and leaves of Olea europaea.	https://pubmed.ncbi.nlm.nih.gov/24279741/	https://pubmed-ncbi-nlm-nih-gov.translate.goog/24279741/	Oleanolic acid, maslinic acid, uvaol, and erythrodiol are the main triterpenes present in olives, olive tree leaves, and virgin olive oil. Their concentration in virgin olive oil depends on the quality of the olive oil and the variety of the olive tree. So, in this work explores all of the bioactive properties so far described for the main triterpenes present in virgin olive oil.	Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	It provides information on the main triterpenes present in virgin olive oil that can be extracted as biochemical compounds present in the value chain.

5	2013	S. Dermeche a , M. Nadour a , C. Larroche , F. Moulti-Mati a, P. Michaud	**Olive mill wastes: Biochemical characterizations and valorization strategies**	https://www.sciencedirect.com/science/article/abs/pii/S1359511313003917?via%3Dihub	https://www-sciencedirect-com.translate.goog/science/article/abs/pii/S1359511313003917?via%3Dihub&_x_tr_sl=es&_x_tr_hl=nl&_x_tr_pto=wapp	The extraction of olive oil is achieved through discontinuous or continuous processes. The two processes yield three fractions: a solid residue and two liquid phases (oil and olive mill wastewater). The characterization of these two by-products showed that they are mainly composed of phenolic compounds, carbohydrates, organic acids and mineral nutrients variably distributed depending on the process employed and the agronomic practices.	Biofertigation through reutilization of wastewater from olive processing (alpechin).	Olive oil extraction produces a solid residue and dark-colored wastewater containing nutrients that can be further bioprocessed in. In addition, valuable resources such as mineral nutrients, especially potassium, which could potentially be reused as a fertilizer.
6	2011	Beligh Mechri, Hechmi Cheheb, Olfa Boussadia, Faouzi Attia, Fethi Ben Mariem, Mohamed Braham, Mohamed Hammami	**Effects of agronomic application of olive mill wastewater in a field of olive trees on carbohydrate profiles, chlorophyll a fluorescence and mineral nutrient content**	https://www.sciencedirect.com/science/article/abs/pii/S0098847210002601?via%3Dihub	https://www-sciencedirect-com.translate.goog/science/article/abs/pii/S0098847210002601?via%3Dihub&_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	The organic fraction of the OMW (Olive mill wastewater) contains a complex consortium of phenolic substances, some nitrogenous compounds (especially amino acids), organic acids, sugars, tannins, pectins, carotenoids, polyphenols and almost all of the water soluble constituents of the olives. The inorganic fraction contains chloride, sulfate, and phosphoric salts of potassium as well as calcium, iron, magnesium, sodium, copper, and other trace elements in various chemical forms. The inorganic constituents at the concentration levels found in OMW are not toxic; quite the reverse, they may potentially serve as good sources of plant nutrients and thereby rendering this effluent potentially suitable for recycling as a soil. In addition, in organic and sustainable farming, the nutritional value of OMW as well as its potential herbicidal activity, and ability to induce suppression against soil-borne plant pathogens are of extra value.	Biofertigation through reutilization of wastewater from olive processing (alpechin).	Since the inorganic components at the concentration levels found in the OMW are non-toxic; they may be potentially suitable for recycling and use in cosmetics and other by-products.
7	2023	Inmaculada Carmona, Itziar Aguirre, Daniel M. Griffith, Aranzazu García-Borrego	**Towards a circular economy in virgin olive oil production: Valorization of the olive mill waste (OMW) "alpeorujo" through polyphenol recovery with natural deep eutectic solvents (NADESs) and vermicomposting**	https://www.sciencedirect.com/science/article/pii/S0048969723008148	https://www-sciencedirect-com.translate.goog/science/article/pii/S0048969723008148?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	The best substrate for vermicomposting was determined by the worm biomass, growth rate, carbon to nitrogen (C:N) ratio, and N and P content. AlpeoNADES and manure 3:1 produced the highest quality vermicompost in the shortest time, generating a product that complied with European standards for organic fertilizers. Hence, alpeoNADES was recycled to a low cost, organic balanced fertilizer in Stage 3, enabling the olive oil industry to transition to sustainable production through this integrated circular economy design.	Both	The recovery of bioactive phenolic compounds fromthe fresh OMWusing natural deep eutectic solvents (NADESs), show how it possible the generating a valuable phenolic extract and a new by-product, a dephenolized OMW named "alpeoNADES that can be use as well for other products. In addition, its demostrates citric acid and fructose (CF) is the most effective solvent to obtain phenolic extracts for nutraceutical and agronomical purposes.
8	2020	Alessandra Ricelli, Fabio Gionfra, Zulema Percario, Martina De Angelis, Ludovica Primitivo, Veronica Bonfantini, Roberto Antonioletti, Simonetta Maria Bullitta, Luciano Saso, Sandra Incerpi, and Jens Zacho Pedersen	**Antioxidant and Biological Activities of Hydroxytyrosol and Homovanillic Alcohol Obtained from Olive Mill Wastewaters of Extra-Virgin Olive Oil Production**	https://pubs.acs.org/doi/10.1021/acs.jafc.0c05230	https://pubs-acs-org.translate.goog/doi/10.1021/acs.jafc.0c05230?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Among the variety of bioactive components found in olives, several phenolic compounds such as hydroxytyrosol (HT) 4-(2-hydroxyethyl)-1,2-benzenediol seem to have key roles. These phenols are powerful hydrogen-donating antioxidants and scavengers of reactive oxygen and nitrogen species. In the course of this study, the synthesis of homovanillic alcohol (HA) and hydroxytyrosol (HT) from tyrosol (TY), a byproduct from the production of olive oil, has been examined. The effect of HA and HT on ROS production and on cell proliferation in THP-1 and L-6 cell lines was also evaluated.	Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	Extra-virgin olive oil (EVOO) contain substances such as hydroxytyrosol (HT) and its metabolite homovanillic alcohol (HA). HT has aroused much interest due to its antioxidant activity as a radical scavenger and therefore as principal component of several products.
9	2017	T. Chatzistathis, T. Koutsos	**Olive mill wastewater as a source of organic matter, water and nutrients for restoration of degraded soils and for crops managed with sustainable systems,Agricultural Water Management,**	https://www.sciencedirect.com/science/article/pii/S0378377417301774	https://www-sciencedirect-com.translate.goog/science/article/abs/pii/S0378377417301774?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Present and thoroughly discuss all the beneficial aspects of OMW application with regard to: i) the restoration of degraded croplands, ii) sustainable crop management, based on the most important and recently published papers. In addition, the environmental consequences of exaggerate and untreated OMW applications, together with some solutions (strategies) adopted for eliminating soil and groundwater contamination and phytotoxicity are also presented in this article.	Biofertigation through reutilization of wastewater from olive processing (alpechin).	OMW is a low-cost source of nutrients (especially N, P, K, Mg and Fe), water, and organic matter; thus, it can be successfully used for the restoration of degraded croplands, in hilly, eroded, poor in organic C, and/or semi-arid areas.

10	2012	Beatriz Gómez-Muñoz, David J. Hatch, Roland Bol and Roberto García-Ruiz	**The Compost of Olive Mill Pomace: From a Waste to a Resource - Environmental Benefits of Its Application in Olive Oil Groves**	https://www.intechopen.com/chapters/38104	-	Composted olive mill pomace is a worthwhile strategy to reduce the environmental problems associated with the disposal of OLM, and increases the sustainability and ecological services of olive oil cultivation.	Biofertigation through reutilization of wastewater from olive processing (alpechin).	Environmental services linked to the recycling of olive mill pomace throughout composting are indicated.
11	2022	Narjes Malekjani & Seid Mahdi Jafari	**Valorization of olive processing by-products via drying technologies: a case study on the recovery of bioactive phenolic compounds from olive leaves, pomace, and wastewater.**	https://www.tandfonline.com/doi/abs/10.1080/10408398.2022.2068123	https://www-tandfonline-com.translate.goog/doi/abs/10.1080/10408398.2022.2068123?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	The production of value-added ingredients from Olive by-products is not extensively exploited on the industrial scale. Drying is a critical pretreatment before extraction that can have a direct impact on the recovery and yield of the available bioactive compounds in olive by-products. In order to produce more stable and high quality phenolic products, encapsulation using spray and freeze drying is used.	Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	In this study, the effect of the drying process before and after the extraction of bioactive compounds from olive by-products as an important source of phenolic compounds is reviewed.
12	2020	Juan Carlos Hidalgo Moya Ana Leyva Bollero Javier Hidalgo Moya Daniel Pérez Mohedano Victorino Vega Macías	**La Fertilización Foliar en Olivar. Corrección de Carencias Nutricionales**	https://www.juntadeandalucia.es/agriculturaypesca/ifapa/servifapa/registro-servifapa/6379c212-eb77-4251-9e9a-db6665f3b4ba	https://www-juntadeandalucia-es.translate.goog/agriculturaypesca/ifapa/servifapa/registro-servifapa/6379c212-eb77-4251-9e9a-db6665f3b4ba?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Fertilization is a cultivation practice widely used by olive growers, playing an important role in the productive, environmental and economic sustainability of the crop. Its main objective is to achieve plantations with high productive potential, both in quantity and quality. This document focuses on the application of fertilizers in olive groves by foliar route.	Both	This study provides knowledge about the nutritional and fertilization needs of the Andalusian olive grove.
13	2020	García Martín, Juan Francisco, Manuel Cuevas, Chao-Hui Feng, Paloma Álvarez Mateos, Miguel Torres García, and Sebastián Sánchez.	**Energetic Valorisation of Olive Biomass: Olive-Tree Pruning, Olive Stones and Pomaces**	https://www.mdpi.com/2227-9717/8/5/511	https://www-mdpi-com.translate.goog/2227-9717/8/5/511?_x_tr_sl=auto&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	The objective of this paper is to comprehensively review the latest advances focused on energy production from olive-pruning debris, olive stones and pomaces, including processes such as combustion, gasification and pyrolysis, and the production of biofuels such as bioethanol and biodiesel.	Both	This study provides a better understanding of the properties and recovery possibilities of pruning waste, olive pits and pomace.
14	2018	Berbel, J., Gutiérrez-Martín, C., & La Cal, J. A.	**Valorización de los subproductos de la cadena del aceite de oliva.**	https://dialnet.unirioja.es/servlet/articulo?codigo=6648781	https://dialnet-unirioja-es.translate.goog/servlet/articulo?codigo=6648781&_x_tr_sl=es&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	This article describes the generation of residual biomass and by-products of the olive oil value chain in the European Union. The current use of this biomass, which is mainly valorized for electricity generation, is analyzed. New opportunities for the use of residual biomass are analyzed, such as the production of solid biofuels with high added value, the obtention of second-generation biofuels (bioethanol), functional livestock feed or the obtention of bioactive compounds, among others.	Extraction of biochemical compounds from olive processing activities for production of biofertilizers and cosmetics.	This study provides an overview of the current use of the biomass obtained in the olive oil value chain and the new possibilities for its use.
15	2023	Alaoui, I., El Ghadraoui, O., Tanji, K., Harrach, A., & Farah, A.	**The Olive Mill Pomace: A Sustainable Biofertilizer to Improve Soil Proprieties and Plant Nutrient Uptake**	https://doi.org/10.1007/s12649-023-02324-z	https://link-springer-com.translate.goog/article/10.1007/s12649-023-02324-z?error=cookies_not_supported&code=73e4236c-a63f-42b0-8903-c06ff4f8d318&_x_tr_sl=en&_x_tr_tl=es&_x_tr_hl=en-US&_x_tr_pto=wapp	The objective of this study is to explore innovative recycling solutions for solid wastes obtained from olive oil. In particular, promising technologies for the production of high value-added products from olive oil by-products are presented, with special attention to technologies for the use of olive pomace as a soil-friendly biofertilizer. The application of how this organic matter can affect soil physicochemical properties, plant production, plant nutrient uptake and mineral bioavailability is also discussed.	Both	This study presents promising technologies for the production of high value-added products with olive oil by-products. It also proposes the application of olive oil as an improver of soil properties

SCALE UP
community-driven
bioeconomy development

SCALE-UP Information Package

T2.4 Review and preparation of existing scientific and technological information supporting bio-based solutions

Region:	French Atlantic Arc
Organization:	AC3A
Biomass stream/value chains:	Fibre plants
Bio-based solutions:	Insulation, other buidling material, other markets (textile, chemicals…)

This information package aims at reviewing and collecting information relevant to the SCALE-UP project and for the regional platforms. Relevant studies should aim at supporting the bio-economy rollout in the SCALE-UP regions and of the specific bio-based solutions.

Information on the following topics will be gathered:

1. EU Policies and legislation
2. Research projects
3. Local policies
4. Technical Information on specific biobased solutions
5. Biomass availability & Nutrient recycling

1. EU Policies & Legislation

EU policies and legislation relevant to the SCALE-UP project and bio-based solution.

Other sources of interest: JRC Knowledge Centre for Bioeconomy (English) JRC Knowledge Centre for Bioeconomy (French)

List of important EU policies and legislation

	Date	Name	Link	Translation link (English → French)	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	02-2012	**EU bioeconomy strategy**	https://op.europa.eu/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478	https://op-europa-eu.translate.goog/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	The 2012 European Bioeconomy Strategy paved the way for a more innovative, resource-efficient and competitive society that reconciles food security with the sustainable use of renewable resources for industrial purposes, while ensuring environmental protection. A comprehensive review concluded that it has been a success, notably at mobilising research and innovation, boosting private investments, developing new value chains, promoting the uptake of national bioeconomy strategies and involving stakeholders.	The EU bioeconomy strategy aims at strenghtening and scaling-up bio-based sectors, as well as deploying local bioeconomies across Europe. Through: -The deployment of the bioeconomy will lead to the creation of jobs, especially in rural areas through the growing participation of primary producers in local bioeconomies. -The bioeconomy strategy sets as one of its main goals to support research and innovation and deployment of innovative solutions for the production of new and sustainable bio-based products. -A Strategic Deployment Agenda will be developed, which will provide a long-term vision on pathways to deploy and scale up the bioeconomy in a sustainable and circular manner. -Enhance synergies between existing EU instruments to support local activities. -CAP to support bioeconomies in rural areas.	Relevant to the specific bio-based solutions: -It aims at increasing the availability of secondary materials (such as feed and biowaste) for further exploitation through conventional technologies (e.g. composting and anaerobic digestion) and innovative ways of extracting valuable substances. Innovation is expected to support markets for bio-based products, where one industry's waste becomes the starting material for another. -It addresses new opportunities for the forestry sector, where non-sustainable raw materials in various sectors are replaced with forestry-based materials and chemicals. -Biowaste and residues can be used as valuable resources and can help reduce food waste by 50% by 2030.
2	2019	**European Green Deal**	https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/european-green-deal_en?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	European Green Deal is a set of comprehensive and integrated to transform the EU into a modern, resource-efficient and competitive economy, ensuring no net emissions of green house gases by 2050 and economic growth decoupled from reseource use.	The Green Deal includes measures in agriculture on the reduction of environmental and climate foodprint and increase of competative sustainablility from farm to fork (see below). In the energy sector the Green Deal includes measures to promote eco design of products en renewable energy from sustainable biomass resources.	
3		**European Digital Strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	The EU's digital strategy aims to make this transformation work for people and businesses, while helping to achieve its target of a climate-neutral Europe by 2050.	EU's digital strategy recognises that digital technologies are profoundly changing our world, and generate an ever-increasing amount of data, which if pooled and used properly, can lead to completely new means and levels of value creation, leading towards more sustainable solutions which are resource-efficient, circular and climate-neutral.	Real time tracking, new, added-value creations, interconnections, boosting bio-based solutions driven by new, high and/or deep technologies
4	02-2020	**European data strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	The European data strategy aims to make the EU a leader in a data-driven society. Creating a single market for data will allow it to flow freely within the EU and across sectors for the benefit of businesses, researchers and public administrations.	The EU is creating a single market for data where data can flow within the EU and across sectors, for the benefit of all European rules, in particular privacy and data protection, as well as competition law, are fully respected the rules for access and use of data are fair, practical and clear	By having more information, consumers and users such as farmers, airlines or construction companies will be in a position to take better decisions such as buying higher quality or more sustainable products and services, thereby contributing for example to the Green Deal objectives.

5	01-2023	**Common Agricultural Policy (CAP) 2023-27**	https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-glance_en#cap2023-27	https://agriculture-ec-europa-eu.translate.goog/common-agricultural-policy/cap-overview/cap-glance_en?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=en-US&_x_tr_pto=wapp#cap2023-27	The CAP 2023-2027 must be oriented more than ever to respond to the specific needs of the agricultural sector and rural areas in terms of equity, distribution of support, instruments and characteristics, after the serious health crisis caused by COVID. To achieve these objectives, the CAP is focusing on innovation, CAP Strategic Plans (in line with the objectives and targets of the "Green Deal"), giving the EU a greener and fairer CAP.	The CAP 2023-2027 includes "support for rural development" as one of its focal points through the development of a wide range of tools including: Funding for investment, knowledge creation, innovation and cooperation will in many cases be targeted at environmental and climate-related needs, but will also serve other CAP objectives.	Within the CAP 2023-2027, it is indicated that the improvement of existing requirements is also a necessary condition for the improvement of agricultural sustainability, for this purpose, measures are proposed to improve soil health in the long term, so farmers are required to carry out beneficial crop rotations (among other measures). On the other hand, a wide range of types of action are proposed, including ecosystems that support voluntary actions related to better nutrient management, agroecology, agroforestry, carbon farming or animal welfare (among others).
6	05-2020	**Farm to Fork strategy**	https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en	https://food-ec-europa-eu.translate.goog/horizontal-topics/farm-fork-strategy_en?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=en-US&_x_tr_pto=wapp	The Farm to Fork Strategy is a set of measures to accelerate the transition to a sustainable food system that should have a neutral or positive environmental impact help to mitigate climate change and adapt to its impacts, reverse the loss of biodiversity ensure food security, nutrition and public health, making sure that everyone has access to sufficient, safe, nutritious, sustainable food preserve affordability of food while generating fairer economic returns, fostering competitiveness of the EU supply sector and promoting fair trade.	The Farm to Fork Strategy includes measures to promote sustainable food production and processing (including nutrient recycling). This includes measures on the compatativeness of the EU food supply sector including use of residues for bioproducts	

2. Research Projects

Please add Interreg, Horizon 2020, Horizon Europe projects, and other projects that you find relevant to the SCALE-UP project and for your bio-based solutions.

Other sources of interest:	JRC Knowledge Centre for Bioeconomy (English)	JRC Knowledge Centre for Bioeconomy (French)

List of relevant projects

	Start month	End month	Name	Project website	Translation link (English to French)	Project summary	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions	Activities of interest	Comments
1	1-9-2022	1-8-2025	**MainstreamBIO**	https://mainstreambio-project.eu/	https://mainstreambio--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	MainstreamBIO sets out to get small-scale bio-based solutions into mainstream practice across rural Europe, providing a broader range of rural actors with the opportunity to engage in and speed up the development of the bioeconomy. Regional Multi-actor Innovation Platforms (MIPs) will be established in 7 EU countries (PL, DK, SE, BG, ES, IE and NL) to enhance cooperation among key rural players towards co-creating sustainable business model pathways in line with regional potentials and policy initiatives.	Innovation support services,Decision Support System, Multi-actor Innovation Platforms, Digitalisation and Practice abstracts.	Some cases related with our 12 bio-based solutions (potential exchange of good practices and Knowledge)	WP4, WP5	SCALE-UP sister project
2	1-10-2022	1-9-2025	**RuralBioUp**	https://www.ruralbioup.eu/	https://www-ruralbioup-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	RuralBioUp will strengthen the cooperation among regional key actors and knowledge holders, empowering them to establish an inclusive and long-lasting ecosystem (the RuralBioUp Regional Hubs) to support the mainstreaming of bio-based business models in rural areas. In particular, RuralBioUp will establish 9 Regional Hubs in 6 EU countries, that will co-design and implement 9 Action Plans on 18 value chains.	9 regional hubs (one multi-stakeholder hub) are established in 6 EU countries (France, Romania, Czech Republic, Ireland, Latvia and Italy). 9 Action Plans will be implemented in 18 value chains.	Biomass value chain development: Biomass logistic, Valorisation, Communities. Lessons learnt	WP4, WP5	SCALE-UP sister project
3	1-9-2022	1-8-2025	**BioRural**	https://biorural.eu/	https://biorural-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	BioRural's goal is to create a European Rural Bioeconomy Network to promote small-scale bio-based solutions in rural areas and support the transition towards a sustainable, regenerative, inclusive and just circular Bioeconomy across all Europe at local and regional scale.	BioRural focusses on EU-level developments, it does not feature any regional case studies.	Rural Bioeconomy Alliance. Network. Cooperate to promote the currently available small-scale bio-based solutions		SCALE-UP sister project
4	1-4-2019	1-7-2022	**BE-Rural**	https://be-rural.eu/	https://1-be--rural-eu.translate.goog/?_x_tr_enc=1&_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	BE-Rural aimed at exploring the potential of regional and local bio-based economies and support the development of bioeconomy strategies, roadmaps and business models. To this end, the project focused on establishing Open Innovation Platforms (OIPs) within selected regions in five countries: Bulgaria, Latvia, North Macedonia, Poland and Romania.		Case study in North Macedonia (focussing on Mycelium-based packaging and insulation material); Case study in Latvia (foussing on wood wool)	D5.1 "Briefing paper: Analysing market conditions and designing business models within BE-Rural's OIPs"; D5.2 "Summary report on small-scale bio-based business models and their market potentials"; D5.4 "Note on the development of a sustainability screening for regional bioeconomy strategies"	Power4Bio sister project
5	1-10-2018	1-3-2021	**POWER4BIO**	https://power4bio.eu/	https://power4bio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	POWER4BIO project aimed at empowering regional stakeholders to boost the transition towards bioeconomy regions in Europe by providing them with the necessary tools, instruments and guidance to develop and implement sound sustainable bioeconomy strategies. POWER4BIO targeted 10 regions with a focus on regions in Central and Eastern Europe.		Case study in Andalusia (focussing on Bioeconomy Strategy and Available Biomass Sources At Regional Level (Olive Biomass, Intensive Horticulture and Seaweed production)) and case study in Mazovia (agricultural residues)	D3.3 "Catalogue with bio-based solutions"; D6.4 "Training design and materials for increasing the bioeconomy capacity of regional stakeholders"	BE-Rural sister project; certain outputs related to the development of bio-based solutions were classified as confidential and are thus not publicly available.

Other projects

	Start month	End month	Name	Project website	Translation link (English to French)	Project summary	Relevance to SCALE-UP	Comments
1	09-2022	08-2025	**ShapingBio**	https://www.shapingbio.eu/	https://www-shapingbio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	The overall aim of ShapingBio is to support and accelerate bioeconomy innovation and the deployment of new knowledge in the EU and its member states. ShapingBio aims to provide evidence-based and concrete information and recommendations for better policy alignment and stakeholder actions to realize the cross-sectoral potential of the bioeconomy and to reduce the fragmentation across bio-based sectors and food system and policies across regions, domains and governance levels.	Promote innovation in the EU bioeconomy.	ShapingBio focusses on EU macro-regions, it does not feature any rural case studies.
2	07-2022	06-2025	**BioModel4Regions**	https://www.biomodel4regions.eu/	https://www-biomodel4regions-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	BIOMODEL4REGIONS aims to support the establishment of the innovative governance models at local/regional level to achieve better-informed decision-making processes, social engagement and innovation to support and strengthen EU and international science-policy interfaces to achieve the Sustainable Development Goals.	Support regional bioeconomies.	
3	09-2022	08-2025	**CEE2ACT**	https://www.cee2act.eu/	https://www-cee2act-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	CEE2ACT will empower countries in Central Eastern Europe and beyond to develop circular bioeconomy strategies and action plans through knowledge transfer and innovative governance models enabling sustainability and resilience to achieve better informed decision-making processes, societal engagement and innovation, building on the practice of experienced countries serving as role models.	Development of bioeconomy strategies.	CEE2ACT focusses on national-level developments, it does not feature any regional/rural case studies.
4	09-2022	08-2025	**ROBIN**	https://robin-project.eu/	https://robin--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	ROBIN aims to empower Europe's regions to adapt their governance models and structures in ways that accelerate the achievement of their circular bioeconomy targets while promoting social innovation and accounting for different territorial contexts. In this context, ROBIN will support 5 regional authorities across Europe (Southern Region of Ireland, Central Macedonia, Andalusia, Baden-Wuerttemberg, Zilina) to adapt their governance models to support the scaling up of the bio-based value chains of their ecosystem.	Regional bioeconomy development, as well as social innovation in the bioeconomy, which is covered in WP5 of SCALE-UP.	
5	06-2022	05-2025	**RELIEF**	https://relief.uop.gr/	https://relief-uop-gr.translate.goog/?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	RELIEF aims to develop and deliver an innovative approach for teaching bio-economy in farming, by developing specific learning resources addressing HEIs students and farming practitioners. RELIEF will deliver a training needs analysis and develop two curricula in bio-economy, for HE students, farming practitioners and farmers exploring the key areas that are critical for the implementation of business models and strategies towards bio-economy in farming.	Training courses on bioeconomy, also covered in WP3 of SCALE-UP.	
6	01-2021	06-2023	**COOPID**	https://coopid.eu/	https://coopid-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	Wtin COOPID, a network of bioeconomy clusters from 10 European countries has been created, involving a range of stakeholders: primary producers, in cooperatives or associations, within agriculture, forestry and aquaculture; industry; public sector; research and academia. So-called COOPID ambassadors showcased success stories, organised workshops and conducted interactive dissemination and communication campaigns. The focus was on the uptake of sustainable bio-based business models in the primary production sector.	Development of bioeconomy clusters.	D4.2 "Success story factors for biobased Business models"
7	12-2022	11-2026	**P2GreeN**	https://p2green.eu/	https://p2green-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=nl&_x_tr_pto=wapp	P2GreeN will implement and demonstrate innovative N & P recovery solutions based on human sanitary waste from urban settlements and its conversion into safe bio-based fertilisers for agricultural production. The project will test the solutions in three pilot regions on a north-south trajectory.	Nutrient recovery is a part of SCALE-UP.	

3. Regional, National & Local policies

Please add the local policies (including strategies, roadmaps, incentives, subsidy schemes and regulatory information) that you find relevant to the SCALE-UP project and to your bio-based solutions.

List of relevant policies

	Year	Regional/Provincial/National	Title	Link	Translation link (French → English)	Author/Publisher:	Policies	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	November 2018	National	**Environnemental policy RE2020**	https://www.ecologie.gouv.fr/reglementation-environnementale-re2020	https://www-ecologie-gouv-fr.translate.goog/reglementation-environnementale-re2020?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Ministry of Ecological transition	This law is for all new buildings, buid from january, the 1st. It main purpose is to continue to improve energy performance and comfort building, while reducing their carbon impact	to reduce the carbon impact, it is necessary to use biosourced materials, particularly for insulation.	
2	2023/2025	Regional	**Bioeconomy Stratégie for Normandie**	https://www.bioeconomie-normandie.fr/la-bioeconomie/strategie-bioeconomie/	https://www-bioeconomie--normandie-fr.translate.goog/la-bioeconomie/strategie-bioeconomie/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Conseil Régional de Normandie	The goals of the bioeconomy policy are : • Raising awareness of the bioeconomy among stakeholders economics and research • Complete the regional bioeconomy webside : www.bioeconomie-normandie.fr and its actor mapping • Buiding an observatory of deposits biomass • Continue the structuring of the 5 key sectors of the territory : vegetable proteins, blue bioeconomy, naturla fibers for materials and textile uses, bioenergy and biobased chemistry	The strategy sets concrete measures for the developement of sustainable value chain for fibre crops, used in the construction sector for insulation material.	
3	April 2021	Regional	**Actions Plan for circular economy in Pays de la Loire**	https://www.paysdelaloire.fr/transition-ecologique/economie-circulaire	https://www-paysdelaloire-fr.translate.goog/transition-ecologique/economie-circulaire?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Conseil Régional des Pays de la Loire	The action plan has defined 3 strategic axes: succeeding in the transition to the circular economy, supporting the players in the territory, developing the high-potential circular economy,	The action plan is a resource for the evaluation of available biomass and to complete the regional map of the actors of the circular economy.	the region is committed to the circular economy and to using biosourced materials in its equipment
4	December 2020	Regional	**Regional Biomass Scheme (SRB)**	https://www.pays-de-la-loire.developpement-durable.gouv.fr/schema-regional-biomasse-srb-r1824.html	https://www-pays--de--la--loire-developpement--durable-gouv-fr.translate.goog/schema-regional-biomasse-srb-r1824.html?lang=fr&_x_tr_sl=fr&	Conseil Régional et DREAL des Pays de la Loire	The objectives of the regional biomass plan are to draw up an inventory of the biomass resources likely to have an energy use and to determine the orientations and actions to be implemented at the regional or infra-regional scale to encourage the mobilization of these resources and the development of the corresponding energy sectors (wood energy, methanization, etc.).	This plan helps us for the evaluation of biomass	

5	July 2022	Regional	**Regional Biomass Scheme (SRB)**	https://www.nouvelle-aquitaine.fr/sites/default/files/2021-08/Le%20Sch%C3%A9ma%20R%C3%A9gional%20Biomasse%20Nouvelle-Aquitaine%20-%20Rapport.pdf		Conseil régional Nouvelle Aquitaine.	The objectives of the regional biomass plan are to draw up an inventory of the biomass resources likely to have an energy use and to determine the orientations and actions to be implemented at the regional or infra-regional scale to encourage the mobilization of these resources and the development of the corresponding energy sectors (wood energy, methanization, etc.).	The action plan is a resource for the evaluation of available biomass and to complete the regional map of the actors of the circular economy.	
6		Regional	**Schéma régional du patrimoine naturel et de la biodiversité en Bretagne** *(Regional plan for natural heritage and biodiversity in Brittany)*	https://www.cbd.int/doc/nbsap/sbsap/fr-sbsap-bretagne-fr.pdf		Conseil régional de Bretagne	The objectives of the regional biomass plan are to draw up an inventory of the biomass resources likely to have an energy use and to determine the orientations and actions to be implemented at the regional or infra-regional scale to encourage the mobilization of these resources and the development of the corresponding energy sectors (wood energy, methanization, etc.).		
7	October 2022	Regional	**Regional Biomass Scheme 2030 (SRB)**	https://www.normandie.fr/sites/default/files/2023-05/srb-normandie-presentation.pdf		Conseil Régional de Normandie	The objectives of the regional biomass plan are to draw up an inventory of the biomass resources likely to have an energy use and to determine the orientations and actions to be implemented at the regional or infra-regional scale to encourage the mobilization of these resources and the development of the corresponding energy sectors (wood energy, methanization, etc.).		
8	2020	Regional	**NeoTerra Regional environment scheme**	https://www.nouvelle-aquitaine.fr/sites/default/files/2022-05/Green_social_sustainability_bond_framework_Nouvelle-Aquitaine_2022.PDF		Conseil régional Nouvelle Aquitaine.	New Aquitaine is one of the French regions most impacted by climate change: temperature increase of 1.4°C during the 20th century, increasingly frequent extreme weather events (floods, storms, erosion, drought). its roadmap, Neo Terra, articulated around major principles and specific objectives, covering 11 ambitions.	This plan helps the bioeconomy development	It links bioecomy and climate changes
9	July 2019	National	**Stratégie nationale bas carbone (SNBC)** *(National low-carbon strategy)*	https://www.ecologie.gouv.fr/strategie-nationale-bas-carbone-snbc	https://www-ecologie-gouv-fr.translate.goog/strategie-nationale-bas-carbone-snbc?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	French Ministry of Ecological Transition	The national low-carbon strategy (SNBC) is France's roadmap for reducing its greenhouse gas emissions. It includes: -a long-term objective: carbon neutrality; -a trajectory to achieve it; -45 guidelines covering governance at national and territorial levels, all sectors of activity and cross-cutting issues (carbon footprint, investment, spatial planning, R&D, education and training).	It defines the framework for starting the low-carbon transition in France today. Public decision-makers must take it into account	This strategy is supportive for the biobased building sector as it has among its objectives : - halve energy consumption (including energy saving in housing) - increase carbon sinks (plant fibers store carbon while growing)
10	March 2020	National	**Label bio-base building**	https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000026810976	https://www-legifrance-gouv-fr.translate.goog/jorf/id/JORFTEXT000026810976?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	French Ministry of Ecological Transition	The certification label guarantes the building is made with bio-based materials. There are 3 levels depending on the numbers of bio-based materials used	Using Fibers plants as bio-based materials allows to have the national label	Specific label for bio-based materials
11	October 2014	National	**Norme de terminologie NF-EN 16575**	https://www.boutique.afnor.org/fr-fr/norme/nf-en-16575/produits-biosources-vocabulaire/fa178684/1459	https://www.boutique.afnor.org/fr-fr/norme/nf-en-16575/produits-biosources-vocabulaire/fa178684/1459	AFNOR	This document defines the general terms to be used in the field of biobased products, as well as certain cross-cutting aspects concerning biobased product standards.	Helps you get to know the subject's outline	Specific for biobased solutions

12	February 2020	National	**Loi AGEC**	https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000041553759/	https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000041553759/	French Ministry of Ecological Transition	This law is relating to the fight against waste and the circular economy	Link with bioeconomy	Not specific for building sector
13	October 2018	National	**Loi ELAN**	https://www.ecologie.gouv.fr/loi-portant-evolution-du-logement-lamenagement-et-du-numerique-elan	https://www-ecologie-gouv-fr.translate.goog/loi-portant-evolution-du-logement-lamenagement-et-du-numerique-elan?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	French Ministry of Ecological Transition	Building more housing, simplifying standards, protecting the most vulnerable and putting the energy and digital transitions at the service of residents	Helps you get to know the subject's outline	Specific for new building

4. Technical information on specific bio-based solutions

Please add technical information, including scientific information, peer-reviewed articles, reports, and other data or research that you find relevant to the bio-based solutions.

List of relevant technical information

Bio-based insulation and other construction materials, using:

Stream 1: Straw

Steam 2: Miscanthus

Stream 3: Hemp

Stream 4: Flax

Stream 5: All fiber plants

	Date	Author(s)	Title	Link	Translation link (French → English)	Organizations	Summary of contents	Relevant to which solution?	Why is it relevant?
1	2017	Nathalie Fichaux	**Hemp sector plan**	https://www.interchanvre.org/documents/5.actu_presse/documents_de_reference/20180 1_Plan_Filiere_InterChanvre.pdf		InterChanvre	the hemp sector plan gives the many advantages of the cultivation and use of hemp, particularly in terms of the bioeconomy.	Hemp	This study describes the various industrial applications of hemp. And hemps is a sustainable biomass
2	2017	Ministère de la transition écologique : Farid BOU CHERIFI, Laure TRANNOY, Nomadéis : Nicolas DUTREIX,Cédric BAECHER,Barbara PIANU,Isabelle MARX,Martin HABASQUE,	**Etude sur le secteur et les filières de production des matériaux et produits biosourcés utilisés dans la construction** *(Study on the sector and production chains biosourced materials and products used in the construction)*	https://www.pays-de-la-loire.developpement-durable.gouv.fr/etude-nomadeis-sur-le-secteur-et-les-filieres-de-a4670.html	https://www-pays--de--la--loire-developpement--durable-gouv-fr.translate.goog/etude-nomadeis-sur-le-secteur-et-les-filieres-de-a4670.html?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Ministère de la transition écologique et Nomadéis	Economic overview of the sector and bio-based materials sectors for construction outside the wood sector	All fiber plants	
3	2021	Collectif Biosourcé Pays de la Loire	**Collectif bio-sourcés** *(Bio-sourced collective)*	https://www.novabuild.fr/biosource	https://www-novabuild-fr.translate.goog/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Collectif Biosourcé Pays de la Loire	The biosourced collective of the Pays de la Loire brings together construction stakeholders who want to facilitate and promote the use of biosourced materials for construction.	All fiber plants	This collective provide technical knowledge on the subject
4	2022	Cerema	**Rapport sur la comptabilisation des flux de matières à l'échelle des pays de la Loire** *(Report on the accounting of material flows across the Loire region)*	https://doc.cerema.fr/Default/doc/SYRACUSE/586482/rapport-sur-la-comptabilisation-des-flux-de-matieres-a-l-echelle-des-pays-de-la-loire?_lg=fr-FR	https://doc-cerema-fr.translate.goog/Default/doc/SYRACUSE/586482/rapport-sur-la-comptabilisation-des-flux-de-matieres-a-l-echelle-des-pays-de-la-loire?_lg=fr-FR&_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	ADEME	This material flow accounting study on the Pays de la Loire scale constitutes the starting point of a vision of the territory through the prism of extracted, transported and rejected materials.	All fiber plants	This study seeks the preservation of resources and circular economy of construction materials, which is the sector that we have chosen.
5		RMT Biomasse	**Fiche technique valorisation de la biomasse en miscanthus** *(Technical sheet valorization of biomass into miscanthus)*	https://france-miscanthus.org/ressources/fiches-miscanthus-rmt-biomasse/	https://france--miscanthus-org.translate.goog/ressources/fiches-miscanthus-rmt-biomasse/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	France Miscanthus	RMT Biomasse gives a detailed presentation of miscanthus: its advantages and constraints, its growing cycle, its adaptation to the environment, its yields, its cultivation and many other aspects.	Miscanthus	very partial and technical information to develop the biomass

6	2019	RFCP	**Livre vert de la construction en paille** *(Green paper on straw construction)*	https://rfcp.fr/wp-content/uploads/2019/10/Livret-vert.pdf		Réseau Français de la Construction Paille	RFCP gives detailed presentation of staw use in buildings : advantages, restrains and many other aspects	Straw	
7	2021	CNDB	**CONSTRUCTION BOIS & ISOLANTS BIOSOURCÉS** *(WOOD CONSTRUCTION & BIO-SOURCED INSULATION)*	https://cndb.org/ressources/	https://cndb-org.translate.goog/ressources/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Comité national pour le développement du bois	CNDB gives all avantages of biobased insulation	All fiber plants	technical information for meet low-carbon commitments and
8	2012	Luc Floissac, collection Techniques de PRO	**La construction en paille** *(Straw construction)*	https://www.terrevivante.org/boutique/livres/maison-ecologique/la-construction-en-paille/	https://www-terrevivante-org.translate.goog/boutique/livres/maison-ecologique/la-construction-en-paille/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Terre vivante	A complete guide to straw construction.	Straw	It contains all the information professionals and self-builders need to build with straw:
9	jan-24	Cerema	**Guide RE 2020**	https://www.ecologie.gouv.fr/reglementation-environnementale-re2020	https://www-ecologie-gouv-fr.translate.goog/reglementation-	Ministère de la transition écologique	National guide for biobuilding	All fiber plants	
10	jun-19	Réseau Breton Bâtiment Durable	**Prescrire les éco-matériaux dans les marchés publics N°2 - l'isolation paille** *(Prescribing eco-materials in public markets No. 2 - straw insulation)*	https://www.batylab.bzh	https://www-batylab-bzh.translate.goog/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	BATYLAB	As part of the Plan Bâtiment Durable Breton, a guide has been proposed available to professionals to facilitate the prescription of eco-materials, particularly in public procurement.	Straw	
11	mrt-22	BATY.LAB	**Prescrire les éco-matériaux dans les marchés publics n°6 - les bétons et mortiers de chanvre** *(Prescribing eco-materials in public procurement n°6 - hemp concretes and mortars)*	https://www.batylab.bzh/prescrire-eco-materiaux/les-betons-et-mortiers-de-chanvre	https://www.batylab.bzh/prescrire-eco-materiaux/les-betons-et-mortiers-de-chanvre	BATYLAB	As part of the Plan Bâtiment Durable Breton, a guide has been proposed available to professionals to facilitate the prescription of eco-materials, particularly in public procurement.	Hemp	
12	2020. 03	Virginie Le Ravalec, Pierre Bono, Jean Bausset	**Le panorama des marchés «** *fibres végétales techniques en matériaux* » (The overview of the "technical plant fibers in materials" markets)	https://www.f-r-d.fr/etudes/m%C3%A9mento-2020/	https://www.f-r-d.fr/etudes/m%C3%A9mento-2020/	frd & IAR, ADEME	gives the market situation for biosourced materials	All fiber plants	
13	jan-22	François BERT ARVALIS	**Lin fibre - Une valorisation de toutes les composantes de la plante** *(Flax fiber - A valorization of all the components of the plant)*	https://www.arvalis.fr/infos-techniques/une-valorisation-de-toutes-les-composantes-de-la-plante	https://www-arvalis-fr.translate.goog/infos-techniques/une-valorisation-de-toutes-les-composantes-de-la-plante?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	ARVALIS	Gives the market situation for flax fibre	Flax	
14	feb-17	Service Affaires économiques et prospective Chambre d'agriculture des Hauts de France	**Etat des lieux de la filière lin textile dans les Hauts de France** *(State of play of the linen textile industry in Hauts de France)*	https://hautsdefrance.chambres-agriculture.fr/fileadmin/user_upload/National/FAL_commun/publications/Hauts-de-France/filieres-vegetales-chapitre10.pdf		Service Affaires économiques et prospective Chambre d'agriculture des Hauts de France	Gives the market situation for flax fibre	Flax	
15	mei-22	Chambres d'agriculture de Normandie POLE FILIERES - EQUIPE ENERGIES ET BIOSOURCES REALISATEUR : ISABELLE GHESTEM	**Evaluation des ressources agricoles mobilisables pour la construction en Normandie** *(Assessment of agricultural resources available for construction in Normandy)*	https://www.normandie.fr/conseil-agricole-strategique-environnemental-et-economique-cas2e-2024-2026	https://www-normandie-fr.translate.goog/conseil-agricole-strategique-environnemental-et-economique-cas2e-2024-2026?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	Chambres d'agriculture de Normandie POLE FILIERES - EQUIPE ENERGIES ET BIOSOURCES REALISATEUR : ISABELLE GHESTEM	Gives the market situation for flax fibre	Flax	
16	mrt-19	Laura BAHEULIERE	**Innovation le lin c'est du béton** *(Innovation: linen is concrete)*	https://terres-et-territoires.com/bien-dans-ses-bottes/innovation-le-lin-cest-du-beton	https://terres--et--territoires-com.translate.goog/bien-dans-ses-bottes/innovation-le-lin-cest-du-beton?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp		Gives the market situation for flax fibre for buidings	Flax	

17	mrt-22	Alain Jeanroy	**La filière Miscanthus en France** *(The Miscanthus sector in France)*	https://france-miscanthus.org/	https://france--miscanthus-org.translate.goog/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	France Miscanthus	This study gives the many advantages of the cultivation and use of miscanthus, particularly in terms of the bioeconomy.	Miscanthus	
18	dec-21	Pascal Prévot	**Lin Fibre résultats et préconisations** *(Lin Fiber results and recommendations)*	https://www.calameo.com/read/007063788afbdb09d4cca		ARVALIS	This study gives the many advantages of the cultivation and use of flax, particularly in terms of the agronomy.	Flax	
19	jun-21	Benoit Béchet	**Étude sur la formation des prix dans la filière française de production du miscanthus** *(Study on price formation in the French miscanthus production sector)*	https://www.franceagrimer.fr/fam/content/download/65064/document/Etude%20miscanthus%20rapp%20final%202020%20VF.pdf?version=5		France Agri-mer	This study gives the many advantages of the cultivation and use of miscanthus, particularly in terms of economy	Miscanthus	
20	nov-22	Marie Rodin	**Sur les traces d'une nouvelle filière dans le secteur du bâtiment : le miscanthus** *(In the footsteps of a new sector in the construction sector: miscanthus)*	https://dumas.ccsd.cnrs.fr/dumas-03855107v1/file/M1820225320_RONDINMarie.pdf		Ecole Nationale d'architecture de Nantes	This study gives a large view of the oportunities of the miscanthus in the Buidings construction	Miscanthus	

5. Biomass availability studies and nutrient recycling

Please add biomass availability and nutrient recycling studies that you find of interest to the deployment of your bio-based solutions.

List of relevant studies

Bio-based insulation and other construction materials, using:

Stream 1: straw

Steam 2: miscanthus

Stream 3: hemp

Stream 4: flax

Stream 5: all fiber plants

	Year	Author(s)	Title	Link	Translation link (French → English)	Summary of contents	Relevant to which solution?	Why is it relevant?
1	2021	Loïc Monod - France AgriMer	**Bioéconomie : Rapport 2020 de l'Observatoire National des Ressources en Biomasse (ONRB)** *(Bioeconomy: 2020 report from the National Observatory of Biomass Resources (ONRB))*	https://www.franceagrimer.fr/Actualite/Filieres/Bioeconomie/2021/Bioeconomie-Rapport-2020-de-l-Observatoire-National-des-Ressources-en-Biomasse-ONRB	https://www-franceagrimer-fr.translate.goog/Actualite/Filieres/Bioeconomie/2021/Bioeconomie-Rapport-2020-de-l-Observatoire-National-des-Ressources-en-Biomasse-ONRB?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-	The National Observatory of Biomass Resources (ONRB), created by FranceAgriMer in 2009, is a tool for monitoring biomass resources. Its objective is to identify and quantify the available resources and their uses in order, in particular, to anticipate any competition in use.	all fiber plants	This database makes it possible to evaluate the available biomass and its different uses.
2	2022	Sébastien Minette - Chambre Régionale d'Agriculture Nouvelle Aquitaine	**Guide des Pratiques de conservation en grandes cultures : Gestion de la matière organique** *(Guide to Conservation Practices in Field Crops: Management of Organic Matter)*	https://www.inrae.fr/sites/default/files/pdf/3RDF2022_Minette.pdf		"MERCI" method : Estimating the services provided by cover crops on the remobilization of fertilizing elements	straw	Method allows the estimation of the total quantities of carbon returned to the soil and therefore to assess the sustainability of the crop
3	2022	Ministère de la transition écologique et de la cohésion des territoires	**Base de données Sitadel2** (Sitadel2 database)	https://www.statistiques.developpement-durable.gouv.fr/la-base-de-donnees-sitadel2-methodologie	https://www-statistiques-developpement--durable-gouv-fr.translate.goog/la-base-de-donnees-sitadel2-methodologie?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	This database makes it possible to estimate the number of new housing constructions in real time	all fiber plants	This database will allow us to develop prospective scenarios for the development of the bio-sourced materials market in relation to the constructions carried out.
4	2022	RFCP : Réseau Français de la Construction Paille	**FDES : Fiches de déclaration environnementale et sanitaire** *(FDES: Environmental and health declaration sheets)*	https://www.inies.fr/	https://www-inies-fr.translate.goog/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	FDES is a standardized document that presents the results of the Life Cycle Analysis of a product as well as health information in order to calculate the environmental and health performance of the building for its eco-design.	straw	Gives environmental impact of the use of each bio-based material in building sector

5	2022	Hélène Lenormand, UniLasalle	**Faire pousser des isolants thermiques : un panorama des matériaux disponibles en France** *(Growing thermal insulators: an overview of the materials available in France)*	https://www.unilasalle.fr/actualites/faire-pousser-des-isolants-thermiques-un-panorama-des-materiaux-disponibles-en-france	https://www-unilasalle-fr.translate.goog/actualites/faire-pousser-des-isolants-thermiques-un-panorama-des-materiaux-disponibles-en-france?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Describe availaibilities of vegetables for biobased solutions	all fiber plants	Help to know biomass availaibility
6	2022	Construction paille	**Le panorama de la construcion paille** *(The panorama of straw construction)*	http://www.constructionpaille.fr/panorama/	https://www-constructionpaille-fr.translate.goog/panorama/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	It's an observatory that provides a detailed, statistical overview of existing and future construction projects.	straw	Provide a real-time statistical tool of buiding in straw
7	2023	France Miscanthus	**Les chiffres de la filière française** *(Figures from the French sector)*	https://france-miscanthus.org/le-miscanthus-en-chiffres/	https://france--miscanthus-org.translate.goog/le-miscanthus-en-chiffres/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Overview of key figures for miscanthus production in France	miscanthus	Gives real figures of miscanthus production
8	2020.06	Benoit BECHET, Agrex Consulting	**Étude sur la formation des prix dans la filière française de production du miscanthus** *(Study on price formation in the French miscanthus production sector)*	Étude sur la formation des prix dans la filière française de production du miscanthus (franceagrimer.fr)		Studie of miscanthus value chain	miscanthus	Gives keys and figures to understand miscanthus value chain.
9	2022.05	Isabelle GHESTEM, Chambre d'agriculture de Normandie	**Evaluation des ressources agricoles mobilisables pour la construction en Normandie** *(Assessment of agricultural resources available for construction in Normandy)*	non public document		Assessment of agricultural resources available for construction in Normandy	all fiber plants	Gives the situation of fiber plant in Normandie
10	2019.02	Karibati & Orialis	**Perspectives de développement de la filière chanvre en Nouvelle-Aquitaine** *(Development prospects for the hemp sector in New Aquitaine)*	https://entreprises.nouvelle-aquitaine.fr/filieres-prioritaires/chanvre	https://entreprises-nouvelle--aquitaine-fr.translate.goog/filieres-prioritaires/chanvre?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Explain hemp value in Nouvelle Aquitaine	hemp	
11	2020	Terres Inovia	**GUIDE de la culture du Chanvre** *(GUIDE to growing Hemp)*	https://www.terresinovia.fr/p/guide-chanvre	https://www-terresinovia-fr.translate.goog/p/guide-chanvre?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Explain hemps culture	hemp	

12	2023	Chambre d'agrciulture des Landes	**Fiche technique du Miscanthus** *(Technical sheet of Miscanthus)*	https://landes.chambre-agriculture.fr/techniques-et-innovations/productions-vegetales/miscanthus/	https://landes-chambre--agriculture-fr.translate.goog/techniques-et-innovations/productions-vegetales/miscanthus/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Explain miscanthus culture	miscanthus	Gives figures of nutrients need
13	2021	Pauline RIO, FDCIVAM	**Transformer et récolter du chanvre à la ferme** *(Processing and harvesting hemp on the farm)*	www.pays-de-la-loire.chambres-agriculture.fr/pei-sante-du-vegetal	https://pays--de--la--loire-chambres--agriculture-fr.translate.goog/pei-sante-du-vegetal/?_x_tr_sl=fr&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	Describe hemp production	hemp	

SCALE UP
community-driven
bioeconomy development

SCALE-UP Information Package

Review and preparation of existing scientific and technological information supporting bio-based solutions

Region:	Northern Sweden
Name:	Magnus Matisons, Barbro Kalla, Eva Fridman
Organization:	BioFuel Region
Biomass stream/value chains:	Logging residues & other forestry by-products
Bio-based solutions:	Natural rubber from bark and high value chemicals

This information package aims at reviewing and collecting information relevant to the SCALE-UP project and for the regional platforms. Relevant studies should aim at supporting the bio-economy rollout in the SCALE-UP regions and of the specific bio-based solutions.

Information on the following topics will be gathered:

1. EU Policies and legislation
2. Research projects
3. Local policies
4. Technical Information on specific biobased solutions
5. Biomass availability & Nutrient recycling

1. EU Policies & Legislation

EU policies and legislation relevant to the SCALE-UP project and bio-based solution.

Other sources of interest: JRC Knowledge Centre for Bioeconomy (English) JRC Knowledge Centre for Bioeconomy (Swedish)

List of important EU policies and legislation

	Date	Name	Link	Translation link	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	02-2012	**EU bioeconomy strategy**	https://op.europa.eu/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478	https://op-europa-eu.translate.goog/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478?_x_tr_sl=en&_x_tr_tl=sv&_x_tr_hl=nl&_x_tr_pto=wapp	The 2012 European Bioeconomy Strategy paved the way for a more innovative, resource-efficient and competitive society that reconciles food security with the sustainable use of renewable resources for industrial purposes, while ensuring environmental protection. A comprehensive review concluded that it has been a success, notably at mobilising research and innovation, boosting private investments, developing new value chains, promoting the uptake of national bioeconomy strategies and involving stakeholders.	The EU bioeconomy strategy aims at strenghtening and scaling-up bio-based sectors, as well as deploying local bioeconomies across Europe. Through: -The deployment of the bioeconomy will lead to the creation of jobs, especially in rural areas through the growing participation of primary producers in local bioeconomies. -The bioeconomy strategy sets as one of its main goals to support research and innovation and deployment of innovative solutions for the production of new and sustainable bio-based products. -A Strategic Deployment Agenda will be developed, which will provide a long-term vision on pathways to deploy and scale up the bioeconomy in a sustainable and circular manner. -Enhance synergies between existing EU instruments to support local activities. -CAP to support bioeconomies in rural areas.	Relevant to the specific bio-based solutions: -It aims at increasing the availability of secondary materials (such as feed and biowaste) for further exploitation through conventional technologies (e.g. composting and anaerobic digestion) and innovative ways of extracting valuable substances. Innovation is expected to support markets for bio-based products, where one industry's waste becomes the starting material for another. -It addresses new opportunities for the forestry sector, where non-sustainable raw materials in various sectors are replaced with forestry-based materials and chemicals. -Biowaste and residues can be used as valuable resources and can help reduce food waste by 50% by 2030.
2	2019	**European Green Deal**	https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/european-green-deal_en?_x_tr_sl=en&_x_tr_tl=sv&_x_tr_hl=nl&_x_tr_pto=wapp	European Green Deal is a set of comprehensive and integrated to transform the EU into a modern, resource-efficient and competitive economy, ensuring no net emissions of green house gases by 2050 and economic growth decoupled from reseource use.	The Green Deal includes measures in agriculture on the reduction of environmental and climate foodprint and increase of competative sustainablility from farm to fork (see below). In the energy sector the Green Deal includes measures to promote eco design of products en renewable energy from sustainable biomass resources.	
3		**European Digital Strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en?_x_tr_sl=en&_x_tr_tl=sv&_x_tr_hl=nl&_x_tr_pto=wap	The EU's digital strategy aims to make this transformation work for people and businesses, while helping to achieve its target of a climate-neutral Europe by 2050.	EU's digital strategy recognises that digital technologies are profoundly changing our world, and generate an ever-increasing amount of data, which if pooled and used properly, can lead to completely new means and levels of value creation, leading towards more sustainable solutions which are resource-efficient, circular and climate-neutral.	Real time tracking, new, added-value creations, interconnections, boosting bio-based solutions driven by new, high and/or deep technologies
4	02-2020	**European data strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en?_x_tr_sl=en&_x_tr	The European data strategy aims to make the EU a leader in a data-driven society. Creating a single market for data will allow it to flow freely within the EU and across sectors for the benefit of businesses, researchers and public administrations.	The EU is creating a single market for data where data can flow within the EU and across sectors, for the benefit of all European rules, in particular privacy and data protection, as well as competition law, are fully respected the rules for access and use of data are fair, practical and clear	By having more information, consumers and users such as farmers, airlines or construction companies will be in a position to take better decisions such as buying higher quality or more sustainable products and services, thereby contributing for example to the Green
5	05-2020	**Farm to Fork strategy**	https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en	https://food-ec-europa-eu.translate.goog/horizontal-topics/farm-fork-strategy_en?_x_tr_sl=en&_x_tr_tl=fr&_x_tr_hl=en-US&_x_tr_pto=wapp	The Farm to Fork Strategy is a set of measures to accelerate the transition to a sustainable food system that should have a neutral or positive environmental impact help to mitigate climate change and adapt to its impacts, reverse the loss of	The Farm to Fork Strategy includes measures to promote sustainable food production and processing (including nutrient recycling). This includes measures on the compatativeness of the EU food supply sector including use of residues for bioproducts	

6	2018	REGULATION (EU) 2018/841 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use, land use change and forestry in the 2030 climate and energy framework LULUCF	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32018R0841	https://eur--lex-europa-eu.translate.goog/legal-content/EN/TXT/?uri=CELEX:32018R0841&_x_tr_sl=en&_x_tr_tl=sv&_x_tr_hl=nl&_x_tr_pto=wapp	Pending formal adoption, the Council and Parliament set an overall EU-level objective of 310 Mt CO2 equivalent of net removals in the LULUCF sector in 2030. According to the provisional agreement, the current rules under which emissions do not exceed removals (the "no debit rule") will continue to apply until 2025. For the period from 2026-2030, where removals should exceed emissions, each member state will have a binding national target for 2030. The agreement maintains the distribution of targets between member states as proposed by the Commission.	Sweden's share of the overall objective is about 1/6. This will most probably affect the levels of harvest.	Lower harvest rates will affect both the abundance of harvest residuals and residual streams at the sawmills and pulp and paper factory. Sweden will vote no to the proposal in the council of ministers.
7		Revision of the Renewable energy directive. COM/2021/557	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0557	https://eur--lex-europa-eu.translate.goog/legal-content/EN/TXT/?uri=CELEX:52021PC0557&_x_tr_sl=en&_x_tr_tl=sv&_x_tr_hl=nl&_x_tr_pto=wapp	The EU Parliment suggests that primary biomass should not be considered sustainable.	Primary biomass i.e. primarily logging residues is a crucial part of the district heating system in Sweden and has been calculated to replace sawdust when sawdust is uppgraded to materials, chemicals and fuels in biorefineries	If adopted harvest residues will be seen as not sustaiable and will stay to decompose in the forests and hinders the development of a number of biorefinery initiatives. The overall ecomomy for the forest owner will be lower.
8	2023	REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on the making available on the Union market as well as export from the Union of certain commodities and products associated with deforestation and forest degradation and repealing Regulation (EU) No 995/2010	https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32023R1115	https://eur--lex-europa-eu.translate.goog/legal-content/EN/TXT/?uri=CELEX:32023R1115&_x_tr_sl=en&_x_tr_tl=sv&_x_tr_hl=nl&_x_tr_pto=wapp	The legislation must prevent consumption and production in the EU from contributing to deforestation. Forestry within the EU rarely does. Deforestaion maily occures when chanching land use from forestry to agriculture or infrastructure	The council and the parlament set an innovative concept for the definition of 'forest degradation' meaning the structural changes to forest cover, taking the form of the conversion of naturally regenerating forests and primary forests into plantation forests and other wooded land and the conversion of primary forests into planted forests.	While complying to the Swedish forestry act the administrative burden for forest owners will increase significantly and especially the small forest owners will have problems to provide the requested data. Financial institutes and banks forsee problems to invest in forest related business. They are not alowed to do so if there are the slightest risk for degeneration of forests. The definition of degeneration is somewhat unclear regarding plantation forests and planted forests. Imports from the US, Canada and Russia will not be possible.
9	2022	Nature restoration directive	https://environment.ec.europa.eu/topics/nature-and-biodiversity/nature-restoration-law_en	https://environment-ec-europa-eu.translate.goog/topics/nature-and-biodiversity/nature-restoration-law_en?_x_tr_sl=en&_x_tr_tl=sv&_x_tr_hl=nl&_x_tr_pto=wapp	The Commission has proposed a new law to restore ecosystems for people, the climate and the planet.	The nature restoration directive is a key element of the EU Biodiversity Strategy, which calls for binding targets to restore degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters. This is related to the ecological boundaries studied in the project.	
10	07-2021	Forest strategy	https://environment.ec.europa.eu/strategy/forest-strategy_en	https://environment-ec-europa-eu.translate.goog/strategy/forest-strategy_en?_x_tr_sl=en&_x_tr_tl=sv&_x_tr_hl=nl&_x_tr_pto=wapp	EU objectives: The strategy sets a vision and concrete actions to improve the quantity and quality of EU forests and strengthen their protection, restoration and resilience. It aims to adapt Europe's forests to the new conditions, weather extremes and high uncertainty brought about by climate change. This is a precondition for forests to continue delivering their socio-economic functions, and to ensure vibrant rural areas with thriving populations.	The aim is: Significant systemic changes for the forestry sector, through a transition from primarily timber-based to more complex revenue streams. Stresses among other things the cascading principle. The strategy advocate other silvicultural management systems than clearcutting and non woody products management. SHarvest of forest biomass will most likely be effected	The overall ecomomy for the Swedish forest owner will be lower. Continuous cover forestry management will make the removal of branches and tops too costly due to the low volumes per hectare. The cascading principle is good in theory, but doesen't work in practice in a forest rich country as Sweden. Due to it's properties some of the biomass assortments are too costly to transport. This creates uncertenties regarding availability of rawmaterial.

2. Research Projects

Please add Interreg, Horizon 2020, Horizon Europe projects, and other projects that you find relevant to the SCALE-UP project and for your bio-based solutions.

Other sources of interest:	JRC Knowledge Centre for Bioeconomy (English)	JRC Knowledge Centre for Bioeconomy (Swedish)

List of relevant projects

	Start month	End month	Name	Project website	Translation link (English to German)	Project summary	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions	Activities of interest	Comments
1	1-9-2022	1-8-2025	**MainstreamBIO**	https://mainstreambio-project.eu/	https://mainstreambio--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	MainstreamBIO sets out to get small-scale bio-based solutions into mainstream practice across rural Europe, providing a broader range of rural actors with the opportunity to engage in and speed up the development of the bioeconomy. Regional Multi-actor Innovation Platforms (MIPs) will be established in 7 EU countries (PL, DK, SE, BG, ES, IE and NL) to enhance cooperation among key rural players towards co-creating sustainable business model pathways in line with regional potentials and policy initiatives.	Innovation support services,Decision Support System, Multi-actor Innovation Platforms, Digitalisation and Practice abstracts.	Some cases related with our 12 bio-based solutions (potential exchange of good practices and Knowledge)		SCALE-UP sister project
2	1-10-2022	1-9-2025	**RuralBioUp**	https://www.ruralbioup.eu/	https://www-ruralbioup-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	RuralBioUp will strengthen the cooperation among regional key actors and knowledge holders, empowering them to establish an inclusive and long-lasting ecosystem (the RuralBioUp Regional Hubs) to support the mainstreaming of bio-based business models in rural areas. In particular, RuralBioUp will establish 9 Regional Hubs in 6 EU countries, that will co-design and implement 9 Action Plans on 18 value chains.	9 regional hubs (one multi-stakeholder hub) are established in 6 EU countries (France, Romania, Czech Republic, Ireland, Latvia and Italy). 9 Action Plans will be implemented in 18 value chains.	Biomass value chain development: Biomass logistic, Valorisation, Communities. Lessons learnt	WP4, WP5	SCALE-UP sister project
3	1-9-2022	1-8-2025	**BioRural**	https://biorural.eu/	https://biorural-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	BioRural's goal is to create a European Rural Bioeconomy Network to promote small-scale bio-based solutions in rural areas and support the transition towards a sustainable, regenerative, inclusive and just circular Bioeconomy across all Europe at local and regional scale.	BioRural focusses on EU-level developments, it does not feature any regional case studies.	Rural Bioeconomy Alliance. Network. Cooperate to promote the currently available small-scale bio-based solutions		SCALE-UP sister project
4	1-4-2019	1-7-2022	**BE-Rural**	https://be-rural.eu/	https://1-be--rural-eu.translate.goog/?_x_tr_enc=1&_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	BE-Rural aimed at exploring the potential of regional and local bio-based economies and support the development of bioeconomy strategies, roadmaps and business models. To this end, the project focused on establishing Open Innovation Platforms (OIPs) within selected regions in five countries: Bulgaria, Latvia, North Macedonia, Poland and Romania.		Case study in North Macedonia (focussing on Mycelium-based packaging and insulation material); Case study in Latvia (foussing on wood wool)	D5.1 "Briefing paper: Analysing market conditions and designing business models within BE-Rural's OIPs"; D5.2 "Summary report on small-scale bio-based business models and their market potentials"; D5.4 "Note on the development of a sustainability screening for regional bioeconomy strategies"	Power4Bio sister project
5	1-10-2018	1-3-2021	**POWER4BIO**	https://power4bio.eu/	https://power4bio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	POWER4BIO project aimed at empowering regional stakeholders to boost the transition towards bioeconomy regions in Europe by providing them with the necessary tools, instruments and guidance to develop and implement sound sustainable bioeconomy strategies. POWER4BIO targeted 10 regions with a focus on regions in Central and Eastern Europe.		Case study in Andalusia (focussing on Bioeconomy Strategy and Available Biomass Sources At Regional Level (Olive Biomass, Intensive Horticulture and Seaweed production)) and Mazovia (agricultural residues)	D3.3 "Catalogue with bio-based solutions"; D6.4 "Training design and materials for increasing the bioeconomy capacity of regional stakeholders"	BE-Rural sister project; certain outputs related to the development of bio-based solutions were classified as confidential and are thus not publicly available.

Other projects

	Start month	End month	Name	Project website	Translation link (English to German)	Project summary	Relevance to SCALE-UP	Comments
1	09-2022	08-2025	**ShapingBio**	https://www.shapingbio.eu/	https://www-shapingbio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	The overall aim of ShapingBio is to support and accelerate bioeconomy innovation and the deployment of new knowledge in the EU and its member states. ShapingBio aims to provide evidence-based and concrete information and recommendations for better policy alignment and stakeholder actions to realize the cross-sectoral potential of the bioeconomy and to reduce the fragmentation across bio-based sectors and food system and policies across regions, domains and governance levels.	Promote innovation in the EU bioeconomy.	ShapingBio focusses on EU macro-regions, it does not feature any rural case studies.
2	07-2022	06-2025	**BioModel4Regions**	https://www.biomodel4regions.eu/	https://www-biomodel4regions-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	BIOMODEL4REGIONS aims to support the establishment of the innovative governance models at local/regional level to achieve better-informed decision-making processes, social engagement and innovation to support and strengthen EU and international science-policy interfaces to achieve the Sustainable Development Goals.	Support regional bioeconomies.	
3	09-2022	08-2025	**CEE2ACT**	https://www.cee2act.eu/	https://www-cee2act-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	CEE2ACT will empower countries in Central Eastern Europe and beyond to develop circular bioeconomy strategies and action plans through knowledge transfer and innovative governance models enabling sustainability and resilience to achieve better informed decision-making processes, societal engagement and innovation, building on the practice of experienced countries serving as role models.	Development of bioeconomy strategies.	CEE2ACT focusses on national-level developments, it does not feature any regional/rural case studies.
4	09-2022	08-2025	**ROBIN**	https://robin-project.eu/	https://robin--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	ROBIN aims to empower Europe's regions to adapt their governance models and structures in ways that accelerate the achievement of their circular bioeconomy targets while promoting social innovation and accounting for different territorial contexts. In this context, ROBIN will support 5 regional authorities across Europe (Southern Region of Ireland, Central Macedonia, Andalusia, Baden-Wuerttemberg, Zilina) to adapt their governance models to support the scaling up of the bio-based value chains of their ecosystem.	Regional bioeconomy development, as well as social innovation in the bioeconomy, which is covered in WP5 of SCALE-UP.	
5	06-2022	05-2025	**RELIEF**	https://relief.uop.gr/	https://relief-uop-gr.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	RELIEF aims to develop and deliver an innovative approach for teaching bio-economy in farming, by developing specific learning resources addressing HEIs students and farming practitioners. RELIEF will deliver a training needs analysis and develop two curricula in bio-economy, for HE students, farming practitioners and farmers exploring the key areas that are critical for the implementation of business models and strategies towards bio-economy in farming.	Training courses on bioeconomy, also covered in WP3 of SCALE-UP.	
6	01-2021	06-2023	**COOPID**	https://coopid.eu/	https://coopid-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	Wtin COOPID, a network of bioeconomy clusters from 10 European countries has been created, involving a range of stakeholders: primary producers, in cooperatives or associations, within agriculture, forestry and aquaculture; industry; public sector; research and academia. So-called COOPID ambassadors showcased success stories, organised workshops and conducted interactive dissemination and communication campaigns. The focus was on the uptake of sustainable bio-based business models in the primary production sector.	Development of bioeconomy clusters.	D4.2 "Success story factors for biobased Business models"
7	12-2022	11-2026	**P2GreeN**	https://p2green.eu/	https://p2green-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	P2GreeN will implement and demonstrate innovative N & P recovery solutions based on human sanitary waste from urban settlements and its conversion into safe bio-based fertilisers for agricultural production. The project will test the solutions in three pilot regions on a north-south trajectory.	Nutrient recovery is a part of SCALE-UP.	

3. Local policies

The local policies (including strategies, roadmaps, incentives, subsidy schemes and regulatory information) relevant to the SCALE-UP project and bio-based solutions.

List of relevant local policies

	Year	Regional/Provincial/National	Title	Title (original language)	Link	Translation link	Author/Publisher:	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	2023	National	**Bioeconomy Strategy for Sweden**	En nationell bioekonomistrategi – ett verktyg för den gröna industriella omställningen, Dir. 2022:77	https://www.regeringen.se/rattsliga-dokument/kommittedirektiv/2022/06/dir.-202277	https://www-regeringen-se.translate.goog/rattsliga-dokument/kommittedirektiv/2022/06/dir.-202277?_x_tr_sl=sv&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	Ministry of Rural Affairs and Infrastructure	A special investigator must produce proposals for a strategy for a sustainable, competitive and growing Swedish bioeconomy and, if necessary, submit proposals for measures to promote the development of the bioeconomy. The purpose is to promote sustainable growth, renewal and employment throughout the country, to contribute to environmental and climate benefits and to create a strengthened ability to provide and reduced vulnerability in society, based on biomass from the forestry, agricultural and fishing industries as well as residual raw materials in food processing.	The investigation will be published in October 2023. The goal regarding reduces vulnerability in society may be relevant to the scale-up project	The investigation will be published in October 2023. The goal regarding reduces vulnerability in society may be relevant to the scale-up project
2		Regional	**Regional development strategies**		https://www.northsweden.eu/english/eu-in-the-region/regional-development-projects/					
3		National	**The Swedish Forestry Act**	**Skogsvårdslagen**	https://www.skogsstyrelsen.se/en/laws-and-regulations/skogsvardslagen/	https://www-skogsstyrelsen-se.translate.goog/en/laws-and-regulations/skogsvardslagen/?_x_tr_sl=sv&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	Swedish Forest Agency	The Forestry Act states the demands that society has on you as a forest owner. The law states that the forest is a renewable resource that is to be managed sustainably yielding a good revenue. At the same time you have an obligation to take consideration to nature, cultural heritage, reindeer husbandry and other interests. In addition to the Forestry Act the Swedish Forest Agency is also the authority responsible the enforcement for parts of the Environmental Act. The Act contains regulations regarding 1)**Reforestation 2) Felling of woodland 3) Natural conservation and cultural heritage 4) Reindeer Husbandry 5) Mountainous Woodland 6) Noble broadleaves woodland 7) Measures against insects**	Sets the rules for forest managemant practicies. Some are in conflict with proposed EU legislation	Sets the rules for forest managemant practicies. Some are in conflict with proposed EU legislation
4	2021	National	Strengthened property rights, flexible forms of protection and increased incentives for nature conservation in the forest based on voluntariness (Government bill 2021/22:58)	Stärkt äganderätt, flexibla skyddsformer och ökade incitament för naturvården i skogen med frivillighet som grund (Regeringens proposition 2021/22:58)	https://www.riksdagen.se/sv/dokument-lagar/dokument/proposition/starkt-aganderatt-flexibla-skyddsformer-och_H90358	https://www-riksdagen-se.translate.goog/sv/dokument-och-lagar/dokument/proposition/starkt-aganderatt-flexibla-skyddsformer-och_H90358/?_x_tr_sl=sv&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp&_x_tr_hist=true	Swedish Govenment	The bill includes, among other things, a proposal that a national goal for increased sustainable growth in the forest should be drawn up. The target's focus should be on increased sustainable growth in biomass through improved forest management while climate adaptation and biodiversity increase	Increased sustainable growth requires active forest management - is in conflict with some of the proposed EU legislations	Increased sustainable growth requires active forest management - is in conflict with some of the proposed EU legislations

4. Technical information on specific bio-based solutions

Technical information, including scientific information, peer-reviewed articles, reports, and other data or research relevant to the bio-based solutions.

List of relevant technical information

	Date	Author(s)	Title	Link	Translation link	Organizations	Summary of contents	Relevant to which solution?	Why is it relevant?
1		Bergström, Dan; Matisons, Magnus	**Forest Refine**	https://publications.slu.se/?file=publ/show&id=63323	https://publications-slu-se.translate.goog/?file=publ/show&id=63323&_x_tr_sl=en&_x_tr_tl=sv&_x_tr_hl=en-US&_x_tr_pto=wapp	Finland: Naturresursinstitutet (LUKE) Vasa universitet, Seinäjoki yrkeshögskola, Central Ostrobothnia Rural Institute, CENTRIA University of Applied Sciences, Kokkola University, Consortium Chydenius Sverige: Sveriges lantbruksuniversitet, BioFuel Region, RISE Processum,	The report desctribes ways to optimize biomass supplies for refineries in the Botnia-Atlantica Region from existing, planned or potential procurements areas.		
2		Skogsstyrelsen	**Skogliga konsekvensanalyser**	https://www.skogsstyrelsen.se/mer-om-skog/skogliga-konsekvensanalyser/	https://www-skogsstyrelsen-se.translate.goog/mer-om-skog/skogliga-konsekvensanalyser/?_x_tr_sl=sv&_x_tr_tl=en&_x_tr_hl=en-US&_x_tr_pto=wapp	The Swedish National Forest Agency makes forest impact analyzes (SKA) in collaboration with the Swedish university och agricultural Sciences - SLU.	In the analyses, they start from a number of scenarios where Sweden's forests are used and managed in different ways and then calculate what consequences this will have over a 100-year period. The latest forest impact assessment was presented in October 2022 and is called SKA 22.	The scenarios show how different political descisions and legislations affect the potential to use forest raw material	The scenarios show how different political descisions and legislations affect the potential to use forest raw material
3		Official Statistics of Sweden, Swedish University of Agricultural Sciences	**Skogsdata**	https://www.slu.se/en/Collaborative-Centres-and-Projects/the-swedish-national-forest-inventory/foreststatistics/skogsdata/	https://www-slu-se.translate.goog/en/Collaborative-Centres-and-Projects/the-swedish-national-forest-inventory/foreststatistics/skogsdata/?_x_tr_sl=en&_x_tr_tl=sv&_x_tr_hl=en-US&_x_tr_pto=wapp	Swedish University of agricultural sciences and the national Swedish forest Agency (data regarding fellings/harvest)	Current data about the Swedish forests from the Swedish National Forest Inventory. The annual publication Skogsdata presents the most up to date statistics about the Swedish forests. Each publication also includes an indepth analysis of a specific theme. Skogsdata is a part of Offical Statistics Sweden	In order to calculate potential and realistic numbers of available forest biomass, this data is crucial	Gives us data on harvests, thinnings and potential volumes of branches and tops

5. Biomass availability studies and nutrient recycling

Biomass availability and nutrient recycling studies of interest to the deployment of the bio-based solutions.

List of relevant studies

	Year	Author(s)	Title	Link	Translation link	Summary of contents	Why is it relevant?	Comments
1		Sydved	**Aktivt skogsbruk**	https://www.sydved.se/aga-och-bruka-skog/vart-erbjudande/sydveds-magasin-aktivt-skogsbruk	https://www-sydved-se.translate.goog/aga-och-bruka-skog/vart-erbjudande/sydveds-magasin-aktivt-skogsbruk?_x_tr_sl=sv	The magazine for all forest owners who want to conduct active forestry. The magazine conveys forestry knowledge and inspiration to those who like forests.		
2	2021	Mona N. Högberg, Peter Högberg, Håkan Wallander and Lars-Ola Nilsson	**Carbon–nitrogen relations of ectomycorrhizal mycelium across a natural nitrogen supply gradient in boreal forest**	https://nph.onlinelibrary.wiley.com/doi/full/10.1111/nph.17701	https://nph-onlinelibrary-wiley-com.translate.goog/doi/full/10.1111/nph.17701?_x_tr_sl=en&_x_tr_tl=sv&_x_tr_hl=nl&_x_tr_pto=wapp	The supply of carbon (C) from tree photosynthesis to ectomycorrhizal (ECM) fungi is known to decrease with increasing plant nitrogen (N) supply, but how this affects fungal nutrition and growth remains to be clarified. We placed mesh-bags with quartz sand, with or without an organic N (15N-, 13C-labeled) source, in the soil along a natural N supply gradient in boreal forest, to measure growth and use of N and C by ECM extramatrical mycelia. Mycelial C : N declined with increasing N supply. Addition of N increased mycelial growth at the low-N end of the gradient. We found an inverse relationship between uptake of added N and C; the use of added N was high when ambient N was low, whereas use of added C was high when C from photosynthesis was low. We propose that growth of ECM fungi is N-limited when soil N is scarce and tree belowground C allocation to ECM fungi is high, but is C-limited when N supply is high and tree belowground C allocation is low. This suggests that ECM fungi have a major role in soil N retention in nutrient-poor, but less so in nutrient-rich boreal forests.	Describes the role of N in boreal forests	
3	2019	RAPPORT 2019/14 Skogsstyrelsen (Swedish Forest Agency)	**Regler och rekommendationer för skogsbränsleuttag och kompensationsåtgärder**	https://www.skogsstyrelsen.se/globalassets/om-oss/rapporter/rapporter-2022202120202019201 8/rapport-2019-14-regler-och-rekommendationer-for-skogsbransleuttag-och-kompensationsatgarder.pdf		The report decribes the rules and recommendations regarding extraction of harvest residues (branches and tops) it includes for example 1) Obligation to notify extraction of harvest residues 2) Rules for compensatory measures 3) Rules regarding serious driving injuries and other considerations 4) Rules regarding the allowed amount/levelsper hectare of brood material for harmful insects.	Describes the variety of limitations connected to extraction of harvest residues.	
4		Energimyndigheten	**Konsekvenser av ett ökat utag v skogsbränsle**	https://www.slu.se/globalassets/ew/org/centrb/cbm/dokument/publikationer-cbm/low-2012-konsekvanser-av-okat-uttag-skogsbransle.pdf		Report "Consequences of an increased withdrawal of forest fuel".		

SCALE UP
community-driven
bioeconomy development

SCALE-UP Information Package

T2.4 Review and preparation of existing scientific and technological information supporting bio-based solutions

Region:	Mazovia
Organization:	Unimos
Biomass stream/value chains:	Agri-food side streams and residues (e.g. apples, pepper)
Bio-based solutions:	1.Biocircular Farm 2.Apple pomace innovation

This information package aims at reviewing and collecting information relevant to the SCALE-UP project and for the regional platforms. Relevant studies should aim at supporting the bio-economy rollout in the SCALE-UP regions and of the specific bio-based solutions.

Information on the following topics will be gathered:

1. EU Policies and legislation
2. Research projects
3. Local policies
4. Technical Information on specific biobased solutions
5. Biomass availability & Nutrient recycling

1. EU Policies & Legislation

EU policies and legislation relevant to the SCALE-UP project and bio-based solution.

Other sources of interest:	JRC Knowledge Centre for Bioeconomy (English)	JRC Knowledge Centre for Bioeconomy (Polish)

List of important EU policies and legislation

	Date	Name	Link	Translation link (English → Polish)	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	02-2012	**EU bioeconomy strategy**	https://op.europa.eu/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478	https://op-europa-eu.translate.goog/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	The 2012 European Bioeconomy Strategy paved the way for a more innovative, resource-efficient and competitive society that reconciles food security with the sustainable use of renewable resources for industrial purposes, while ensuring environmental protection. A comprehensive review concluded that it has been a success, notably at mobilising research and innovation, boosting private investments, developing new value chains, promoting the uptake of national bioeconomy strategies and involving stakeholders.	The EU bioeconomy strategy aims at strenghtening and scaling-up bio-based sectors, as well as deploying local bioeconomies across Europe. Through: -The deployment of the bioeconomy will lead to the creation of jobs, especially in rural areas through the growing participation of primary producers in local bioeconomies. -The bioeconomy strategy sets as one of its main goals to support research and innovation and deployment of innovative solutions for the production of new and sustainable bio-based products. -A Strategic Deployment Agenda will be developed, which will provide a long-term vision on pathways to deploy and scale up the bioeconomy in a sustainable and circular manner. -Enhance synergies between existing EU instruments to support local activities. -CAP to support bioeconomies in rural areas.	Relevant to the specific bio-based solutions: -It aims at increasing the availability of secondary materials (such as feed and biowaste) for further exploitation through conventional technologies (e.g. composting and anaerobic digestion) and innovative ways of extracting valuable substances. Innovation is expected to support markets for bio-based products, where one industry's waste becomes the starting material for another. -It addresses new opportunities for the forestry sector, where non-sustainable raw materials in various sectors are replaced with forestry-based materials and chemicals. -Biowaste and residues can be used as valuable resources and can help reduce food waste by 50% by 2030.
2	2019	**European Green Deal**	https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/european-green-deal_en?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	European Green Deal is a set of comprehensive and integrated to transform the EU into a modern, resource-efficient and competitive economy, ensuring no net emissions of green house gases by 2050 and economic growth decoupled from reseource use.	The Green Deal includes measures in agriculture on the reduction of environmental and climate foodprint and increase of competative sustainablility from farm to fork (see below). In the energy sector the Green Deal includes measures to promote eco design of products en renewable energy from sustainable biomass resources.	
3		**European Digital Strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wa	The EU's digital strategy aims to make this transformation work for people and businesses, while helping to achieve its target of a climate-neutral Europe by 2050.	EU's digital strategy recognises that digital technologies are profoundly changing our world, and generate an ever-increasing amount of data, which if pooled and used properly, can lead to completely new means and levels of value creation, leading towards more sustainable solutions which are resource-efficient, circular and climate-neutral.	Real time tracking, new, added-value creations, interconnections, boosting bio-based solutions driven by new, high and/or deep technologies
4	02-2020	**European data strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	The European data strategy aims to make the EU a leader in a data-driven society. Creating a single market for data will allow it to flow freely within the EU and across sectors for the benefit of businesses, researchers and public administrations.	The EU is creating a single market for data where data can flow within the EU and across sectors, for the benefit of all European rules, in particular privacy and data protection, as well as competition law, are fully respected the rules for access and use of data are fair, practical and clear	By having more information, consumers and users such as farmers, airlines or construction companies will be in a position to take better decisions such as buying higher quality or more sustainable products and services, thereby contributing for example to the Green Deal objectives.

5	01-2023	**Common Agricultural Policy (CAP) CAP 2023-27**	https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-glance_en#cap2023-27	https://agriculture-ec-europa-eu.translate.goog/common-agricultural-policy/cap-overview/cap-glance_en?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=en-US&_x_tr_pto=wapp#cap2023-27	The CAP 2023-2027 must be oriented more than ever to respond to the specific needs of the agricultural sector and rural areas in terms of equity, distribution of support, instruments and characteristics, after the serious health crisis caused by COVID. To achieve these objectives, the CAP is focusing on innovation, CAP Strategic Plans (in line with the objectives and targets of the "Green Deal"), giving the EU a greener and fairer CAP.	The CAP 2023-2027 includes "support for rural development" as one of its focal points through the development of a wide range of tools including: Funding for investment, knowledge creation, innovation and cooperation will in many cases be targeted at environmental and climate-related needs, but will also serve other CAP objectives.	Within the CAP 2023-2027, it is indicated that the improvement of existing requirements is also a necessary condition for the improvement of agricultural sustainability, for this purpose, measures are proposed to improve soil health in the long term, so farmers are required to carry out beneficial crop rotations (among other measures). On the other hand, a wide range of types of action are proposed, including ecosystems that support voluntary actions related to better nutrient management, agroecology, agroforestry, carbon farming or animal welfare (among others).
6	05-2020	**Farm to Fork strategy**	https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en	https://food-ec-europa-eu.translate.goog/horizontal-topics/farm-fork-strategy_en?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=en-US&_x_tr_pto=wapp	The Farm to Fork Strategy is a set of measures to accelerate the transition to a sustainable food system that should have a neutral or positive environmental impact help to mitigate climate change and adapt to its impacts, reverse the loss of biodiversity ensure food security, nutrition and public health, making sure that everyone has access to sufficient, safe, nutritious, sustainable food preserve affordability of food while generating fairer economic returns, fostering competitiveness of the EU supply sector and promoting fair trade.	The Farm to Fork Strategy includes measures to promote sustainable food production and processing (including nutrient recycling). This includes measures on the compatativeness of the EU food supply sector including use of residues for bioproducts	

2. Research Projects

Please add Interreg, Horizon 2020, Horizon Europe projects, and other projects that you find relevant to the SCALE-UP project and for your bio-based solutions.

Other sources of interest: JRC Knowledge Centre for Bioeconomy (English) | JRC Knowledge Centre for Bioeconomy (Polish)

List of relevant projects

	Start month	End month	Name	Project website	Translation link (English to Polish)	Project summary	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions	Activities of interest	Comments
c	02-2022	01-2024	**AURORA**	https://aurora-agrifood.eu	https://aurora--agrifood-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	Aurora is a project aimed at strengthening cluster management excellence, facilitate exchanges and strategic partnering between clusters and specialised eco-system actors and cities across Europe. Aurora will drive and catalyse digital and green transformation towards safe, resilient, healthy and environmentally friendly food systems. The project has a special focus on food quality, food safety and food authenticity and the application of novel, deep and Industry 4.0 technologies	Project working on food safety, quality and authenticity with strong component of circular economy and digitalization of agri-food value chains	The meta-cluster approach will be interested for metaCSEI SCALE-UP cluster	WP5	
2	05-2021	05-2025	**UNLOCK**	https://unlock-project.eu	https://unlock--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	UNLOCK proposes to valorise this waste stream and design a new economically and environmentally sustainable value chain. The bio-based products created will be tailored to the needs of the agriculture sector, with the creation of seed trays, nonwoven geotextiles, mulch films and hydroponic foams through four different technical processes.	The project is related to circular bioeconomy in agri-food sector and working on innovative materials (based on feather that are rich in keratin) using eco-design to close nutrient and carbon cycles	The project can serve as an inspiration for regional stakeholders for the implementation of bio-based solutions	WP4, WP5	
3	02-2023	01-2025	**BIO-BOOST**	https://bio-boost.eu	https://bio--boost-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	The overall objectives of the BIO-Boost project are to increase the latent potential of the participating innovation agencies, to learn from leading innovator regions, and to cement this knowledge and experience in the organisations, building and expanding networks, expanding the cooperation and enlarging the participation of more diverse innovation stakeholders and territories to existing successful initiatives in the bioeconomy, including agri-food, forestry, bio-based chemicals, materials and products, and bioenergy.	The project is boosting bioeconomy by implementing highly interactive events - hackathons and challenges (160 organisations involved), by providing direct SME support on innovation management (24 crossborder KAM cases), and helping widening country SMEs towards financing of innovation projects (50+ cases).	The project is complementary to SCALE UP because of the geographical and thematic scope and approach	WP4, WP5	
1	09-2022	08-2025	**MainstreamBIO**	https://mainstreambio-project.eu/	https://mainstreambio--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	MainstreamBIO sets out to get small-scale bio-based solutions into mainstream practice across rural Europe, providing a broader range of rural actors with the opportunity to engage in and speed up the development of the bioeconomy. Regional Multi-actor Innovation Platforms (MIPs) will be established in 7 EU countries (PL, DK, SE, BG, ES, IE and NL) to enhance cooperation among key rural players towards co-creating sustainable business model pathways in line with regional potentials and policy initiatives.	Innovation support services,Decision Support System, Multi-actor Innovation Platforms, Digitalisation and Practice abstracts.	Some cases related with our 12 bio-based solutions (potential exchange of good practices and Knowledge)	WP4, WP5	SCALE-UP sister project
2	10-2022	09-2025	**RuralBioUp**	https://www.ruralbioup.eu/	https://www-ruralbioup-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	RuralBioUp will strengthen the cooperation among regional key actors and knowledge holders, empowering them to establish an inclusive and long-lasting ecosystem (the RuralBioUp Regional Hubs) to support the mainstreaming of bio-based business models in rural areas. In particular, RuralBioUp will establish 9 Regional Hubs in 6 EU countries, that will co-design and implement 9 Action Plans on 18 value chains.	9 regional hubs (one multi-stakeholder hub) are established in 6 EU countries (France, Romania, Czech Republic, Ireland, Latvia and Italy). 9 Action Plans will be implemented in 18 value chains.	Biomass value chain development: Biomass logistic, Valorisation, Communities. Lessons learnt	WP4, WP5	SCALE-UP sister project

3	09-2022	08-2025	**BioRural**	https://biorural.eu/	https://biorural-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	BioRural's goal is to create a European Rural Bioeconomy Network to promote small-scale bio-based solutions in rural areas and support the transition towards a sustainable, regenerative, inclusive and just circular Bioeconomy across all Europe at local and regional scale.	BioRural focusses on EU-level developments, it does not feature any regional case studies.	Rural Bioeconomy Alliance. Network. Cooperate to promote the currently available small-scale bio-based solutions		SCALE-UP sister project
4	04-2019	07-2022	**BE-Rural**	https://be-rural.eu/	https://1-be--rural-eu.translate.goog/?_x_tr_enc=1&_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	BE-Rural aimed at exploring the potential of regional and local bio-based economies and support the development of bioeconomy strategies, roadmaps and business models. To this end, the project focused on establishing Open Innovation Platforms (OIPs) within selected regions in five countries: Bulgaria, Latvia, North Macedonia, Poland and Romania.		Case study in North Macedonia (focussing on Mycelium-based packaging and insulation material); Case study in Latvia (foussing on wood wool)	D5.1 "Briefing paper: Analysing market conditions and designing business models within BE-Rural's OIPs"; D5.2 "Summary report on small-scale bio-based business models and their market potentials"; D5.4 "Note on the development of a sustainability screening for regional bioeconomy strategies"	Power4Bio sister project
5	10-2018	03-2021	**POWER4BIO**	https://power4bio.eu/	https://power4bio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	POWER4BIO project aimed at empowering regional stakeholders to boost the transition towards bioeconomy regions in Europe by providing them with the necessary tools, instruments and guidance to develop and implement sound sustainable bioeconomy strategies. POWER4BIO targeted 10 regions with a focus on regions in Central and Eastern Europe.		Case study in Andalusia (focussing on Bioeconomy Strategy and Available Biomass Sources At Regional Level (Olive Biomass, Intensive Horticulture and Seaweed production)) and Mazovia (agricultural residues)	D3.3 "Catalogue with bio-based solutions"; D6.4 "Training design and materials for increasing the bioeconomy capacity of regional stakeholders"	BE-Rural sister project; certain outputs related to the development of bio-based solutions were classified as confidential and are thus not publicly available.

Other projects

	Start month	End month	Name	Project website	Translation link (English to Polish)	Project summary	Relevance to SCALE-UP	Comments
1	09-2022	08-2025	**ShapingBio**	https://www.shapingbio.eu/	https://www-shapingbio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	The overall aim of ShapingBio is to support and accelerate bioeconomy innovation and the deployment of new knowledge in the EU and its member states. ShapingBio aims to provide evidence-based and concrete information and recommendations for better policy alignment and stakeholder actions to realize the cross-sectoral potential of the bioeconomy and to reduce the fragmentation across bio-based sectors and food system and policies across regions, domains and governance levels.	Promote innovation in the EU bioeconomy.	ShapingBio focusses on EU macro-regions, it does not feature any rural case studies.
2	07-2022	06-2025	**BioModel4Regions**	https://www.biomodel4regions.eu/	https://www-biomodel4regions-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	BIOMODEL4REGIONS aims to support the establishment of the innovative governance models at local/regional level to achieve better-informed decision-making processes, social engagement and innovation to support and strengthen EU and international science-policy interfaces to achieve the Sustainable Development Goals.	Support regional bioeconomies.	
3	09-2022	08-2025	**CEE2ACT**	https://www.cee2act.eu/	https://www-cee2act-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	CEE2ACT will empower countries in Central Eastern Europe and beyond to develop circular bioeconomy strategies and action plans through knowledge transfer and innovative governance models enabling sustainability and resilience to achieve better informed decision-making processes, societal engagement and innovation, building on the practice of experienced countries serving as role models.	Development of bioeconomy strategies.	CEE2ACT focusses on national-level developments, it does not feature any regional/rural case studies.
4	09-2022	08-2025	**ROBIN**	https://robin-project.eu/	https://robin--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	ROBIN aims to empower Europe's regions to adapt their governance models and structures in ways that accelerate the achievement of their circular bioeconomy targets while promoting social innovation and accounting for different territorial contexts. In this context, ROBIN will support 5 regional authorities across Europe (Southern Region of Ireland, Central Macedonia, Andalusia, Baden-Wuerttemberg, Zilina) to adapt their governance models to support the scaling up of the bio-based value chains of their ecosystem.	Regional bioeconomy development, as well as social innovation in the bioeconomy, which is covered in WP5 of SCALE-UP.	
5	06-2022	05-2025	**RELIEF**	https://relief.uop.gr/	https://relief-uop-gr.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	RELIEF aims to develop and deliver an innovative approach for teaching bio-economy in farming, by developing specific learning resources addressing HEIs students and farming practitioners. RELIEF will deliver a training needs analysis and develop two curricula in bio-economy, for HE students, farming practitioners and farmers exploring the key areas that are critical for the implementation of business models and strategies towards bio-economy in farming.	Training courses on bioeconomy, also covered in WP3 of SCALE-UP.	
6	01-2021	06-2023	**COOPID**	https://coopid.eu/	https://coopid-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	Wtin COOPID, a network of bioeconomy clusters from 10 European countries has been created, involving a range of stakeholders: primary producers, in cooperatives or associations, within agriculture, forestry and aquaculture; industry; public sector; research and academia. So-called COOPID ambassadors showcased success stories, organised workshops and conducted interactive dissemination and communication campaigns. The focus was on the uptake of sustainable bio-based business models in the primary production sector.	Development of bioeconomy clusters.	D4.2 "Success story factors for biobased Business models"
7	12-2022	11-2026	**P2GreeN**	https://p2green.eu/	https://p2green-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	P2GreeN will implement and demonstrate innovative N & P recovery solutions based on human sanitary waste from urban settlements and its conversion into safe bio-based fertilisers for agricultural production. The project will test the solutions in three pilot regions on a north-south trajectory.	Nutrient recovery is a part of SCALE-UP.	

3. Regional, National & Local policies

Please add the local policies (including strategies, roadmaps, incentives, subsidy schemes and regulatory information) that you find relevant to the SCALE-UP project and to your bio-based solutions. Please also look into your country's CAP Strategic Plans and see whether this is relevant to you.

List of relevant policies

	Year	Regional/Provincial/National	Title	Title (original language)	Link	Translation link	Author/Publisher:	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	2021	Regional	**RIS2030 Mazovia**	**Regionalna Strategia Innowacji dla Mazowsza do 2030 roku**	https://innowacyjni.mazovia.pl/dzialania/ris-mazovia/dokumenty/regionalna-strategia-innowacji-dla-mazowsza-do-2030-roku.html	https://innowacyjni-mazovia-pl.translate.goog/dzialania/ris-mazovia/dokumenty/regionalna-strategia-innowacji-dla-mazowsza-do-2030-roku.html?_x_tr_sl=pl&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	Mazovia Regional Government	Strategic framework for the regional innovation ecosystem and smart specialisation of the Mazowieckie voivodeship. RIS 2030 constitutes a kind of a signpost along the paths of regional innovation development, as it enables a better use of the region's resources in the area of research, innovation development or cooperation of entrepreneurs and scientific entities, business support institutions and administration. Strengthening the innovativeness of companies from our region is a necessary condition for meeting the challenge of growing competitiveness on national and international markets. The areas of smart specialisation identified together with the stakeholders areas of smart specialisation discerned along side with its stakeholders are some of the main tools for creating favourable conditions for the development of the Mazowieckie Voivodeship, as well as targeting the public support in line with in the financial perspective 2021-2027	Safe food is one of the Mazovia region RIS3 directly related to bio-based solutions in agri-food sector	Areas of smart specialisation: Safe Food, Smart Systems in Industry and Infrastructure, Modern Business Ecosystem and High Quality of Life indicate directions conducive to Mazovia's development and respond to key challenges at the European level
2	2021	Regional	**Mazovia Bioeconomy Strategy**	**Strategia rozwoju biogospodarki dla Województwa (projekt) Mazowieckiego**	https://www.mae.com.pl/images/PDF/POWER4BIO/Strategia_rozwoju_biogospodarki_dla_Województwa_Mazowieckiego.pdf	-	Mazowiecka Agencja Energetyczna	Project for the developments of bioeconomy in the Mazovia region	The project contains an overview of the Mazovian bioeconomy	

CAP Strategic Plans

	Year	Regional/Provincial/National	Title	Title (original language)	Link	Translation link	Author/Publisher:	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	2022	National	**CAP Strategic Plan 2023-2027**	**Plan Strategiczny dla Wsp**	https://www.gov.pl/web/rolnictwo/plan-strategiczny-dla-wspolnej-polityki-rolnej-na-lata-2023-27	https://www-gov-pl.translate.goog/web/rolnictwo/plan-strategiczny-dla-wspolnej-polityki-rolnej-na-lata-2023-27?_x_tr_sl=pl&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	Ministry of Agriculture and Rural Development Republic of Poland	This support includes interventions in the form of direct payments , i.e.: basic income support - the equivalent of SAPS, redistributive payment, payment for young farmers and production-related support granted in sector 13. A new element of the direct payments system, supporting the implementation of practices beneficial to the environment, climate and animal welfare, are ecoschemes (area and animal welfare). Transitional national supportis also provided(financed from national funds).	Also relates to the fruit production sector and development of rural areas. Possibilities of payments for farmers.	

4. Technical information on specific bio-based solutions

Please add technical information, including scientific information, peer-reviewed articles, reports, and other data or research that you find relevant to the bio-based solutions.

List of relevant technical information

Solution 1: Apple pomace innovation

Solution 2: Bio circular apple farm

	Date	Author(s)	Title	Link	Translation link (English -> Polish)	Organizations	Summary of contents	Relevant to which solution?	Why is it relevant?
1	2020	Fengzhi Lyu , Selma F. Luiz , Denise Rosane Perdomo Azeredo , Adriano G. Cruz , Said Ajlouni and Chaminda Senaka Ranadheera	Apple Pomace as a Functional and Healthy Ingredient in Food Products: A Review	https://www.mdpi.com/2227-9717/8/3/319	https://www-mdpi-com.translate.goog/2227-9717/8/3/319?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=nl&_x_tr_pto=wapp	University of Melbourne, Federal Institute of Rio de Janeiro	Apple pomace is a major by-product obtained during apple juice processing. Several million metric tons of apple pomace are estimated to be generated worldwide every year. However, the recovery rate of this by-product is low. Pomace is commonly disposed and thrown away as a waste, which results in environmental problems and even public health hazards. As a by-product of the apple juice processing industries, pomace contains plenty of different varieties of nutritionally important compounds, such as carbohydrates, phenolic compounds, dietary fiber and minerals. These important compounds can be recovered from apple pomace, or there is even a possibility of using apple pomace in the food systems directly or after minimal processing. Therefore, apple pomace can be utilized in food products to improve their health benefits and commercial values	Apple pomace innovation	This study describes the various industrial applications of apple pomace.
2	2022	Grispoldi L, Ianni F, Blasi F, Pollini L, Crotti S, Cruciani D, Cenci-Goga BT, Cossignani L.	Apple Pomace as Valuable Food Ingredient for Enhancing Nutritional and Antioxidant Properties of Italian Salami	https://pubmed.ncbi.nlm.nih.gov/35883713/	https://pubmed-ncbi-nlm-nih-gov.translate.goog/35883713/	University of Perugia, Istituto Zooprofilattico Sperimentale dell'Umbria	Nowadays, food fortification with bioactive compounds deriving from agri-food waste is of great interest all over the world. In this work, apple pomace (AP), the most abundant by-product of apple juice manufacturing, was characterised by chemical, chromatographic and spectrophotometric analyses.	Apple pomace innovation	
3	2202	Szabo K, Mitrea L, Călinoiu LF, Teleky BE, Martău GA, Plamada D, Pascuta MS, Nemeș SA, Varvara RA, Vodnar DC	Natural Polyphenol Recovery from Apple-, Cereal-, and Tomato-Processing By-Products and Related Health-Promoting Properties	https://pubmed.ncbi.nlm.nih.gov/36432076/	https://pubmed-ncbi-nlm-nih-gov.translate.goog/36432076/	Institute of Life Sciences, University of Agricultural Sciences and Veterinary Medicine, 400372 Cluj-Napoca, Romania	The present understanding of the functionality of polyphenols in health outcomes, specifically, noncommunicable illnesses, is summarized in this review, focusing on the applicability of this evidence in three extensive agrifood industries (apple, cereal, and tomato processing). Moreover, the reintegration of by-products into the food chain via functional food products and personalized nutrition (e.g., 3D food printing) is detailed, supporting a novel direction to be explored within the circular economy concept.	Bio circular apple farm	
4		Cossignani L, Ianni F, Blasi F, Pollini L, Di Michele A, Pagano C, Ricci M, Perioli L.	Effect of Different Drying Treatments and Sieving on Royal Gala Apple Pomace, a Thickening Agent with Antioxidant Properties	https://pubmed.ncbi.nlm.nih.gov/36840253/	https://pubmed-ncbi-nlm-nih-gov.translate.goog/36840253/	Section of Food Sciences and Nutrition, Department of Pharmaceutical Sciences, University of Perugia, 06126 Perugia, Italy.	Currently, there is an increasing interest in the search of natural derived materials as valuable substitutes for microplastics. One of the categories investigated, represented by thickening agents deriving from agri-food waste and apple pomace (AP), was considered of interest. In this study AP was submitted to three different treatments and drying conditions (oven drying at 55 °C for 12 h; homogenization and oven drying at 55 °C for 12 h; homogenization and freeze-drying), and then grinded and sieved obtaining three different dimensional fractions (>400 µm, 250-400 µm and <250 µm). The hydroalcoholic extracts of these fractions, obtained by ultrasound-assisted extraction, were analyzed to compare their total phenol content (TPC), antioxidant properties, and phenol profile.	Apple pomace innovation	

5. Biomass availability studies and nutrient recycling

Please add biomass availability and nutrient recycling studies that you find of interest to the deployment of your bio-based solutions.

List of relevant studies

Solution 1: Apple pomace innovation

Solution 2: Bio circular apple farm

	Year	Author(s)	Title	Link	Translation link	Summary of contents	Relevant to which solution?	Why is it relevant?
1	2021	Yumin Duan, Sanjeet Mehariya, Aman Kumar, Ekta Singh, Jianfeng Yang, Sunil Kumar, Huike Li & Mukesh Kumar Awasthi	Apple orchard waste recycling and valorization of valuable product-A review	https://www.tandfonline.com/doi/full/10.1080/21655979.2021.1872905	https://www-tandfonline-com.translate.goog/action/cookieAbsent?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=en-US&_x_tr_pto=wapp	Huge quantities of apple orchard waste (AOW) generated could be regarded as a promising alternative energy source for fuel and material production. Conventional and traditional processes for disposal of these wastes are neither economical nor environment friendly. Hence, sustainable technologies are required to be developed to solve this long-term existence and continuous growing problem. In light of these issues, this review pays attention towards sustainable and renewable systems, various value-added products from an economic and environmental perspective. Refined bio-product derived from AOW contributes to resource and energy demand comprising of biomethane, bioethanol, biofuels, bio-fertilizers, biochar, and biochemicals, such as organic acid, and enzymes. However, the market implementation of biological recovery requires reliable process technology integrated with an eco-friendly and economic production chain, classified management.	Apple pomace innovation	The study shows how nutrient recycling can be applied to carbohydrate-rich biomass from apple orchard waste, and produce biochemicals and biofertilizers.
2	2019	Arkadiusz Dyjakon	The Influence of Apple Orchard Management on Energy Performance and Pruned Biomass Harvesting for Energetic Applications	https://www.mdpi.com/1996-1073/12/4/632	https://www-mdpi-com.translate.goog/1996-1073/12/4/632?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=en-US&_x_tr_pto=wapp	Agricultural residues coming from permanent crops, such as apple orchards, can support local actions to combat climate change. However, the amount of pruned biomass possible to be harvested from apple orchards and, thus, the energy output, depend mainly on their proper preparation and management. The managing actions are important because they influence the energy balance, the productivity, and the economy of the harvesting process and the potential benefits from the biomass marketing.	Bio circular apple farm	In this study, two different variants of pruning management in an apple orchard during biomass harvesting applying baling technology were analyzed.
3	2018	Arkadiusz Dyjakon	Harvesting and Baling of Pruned Biomass in Apple Orchards for Energy Production	https://www.mdpi.com/1996-1073/11/7/1680	https://www-mdpi-com.translate.goog/1996-1073/11/7/1680?_x_tr_sl=en&_x_tr_tl=pl&_x_tr_hl=en-US&_x_tr_pto=wapp	Pruning residues belong to the agricultural wastes generated in the agro-food processing sector, whose energetic potential can have a significant influence on the local energy market. This study is focused on the assessment of the feasibility of using apple tree pruning residues in the form of bales for energetic purposes. The research was performed in a commercial apple orchard located in the central-western part of Poland, an area characterized by the largest concentration of apple orchard in Europe.	Bio circular apple farm	Assesment of the yearly harvested pruned biomass to be considered as an energy source for local heating systems.

4	2016	Janusz Wojdalski, Józef Grochowicz, Adam Ekielski, Kamila Radecka, Sylwester Stępniak, Arkadiusz Orłowski, Iwona Florczak, Bogdan Drożdż, Tomasz Żelaziński, Grzegorz Kosmala	Production and Properties of Apple Pomace Pellets and their Suitability for Energy Generation Purposes	https://ros.edu.pl/images/roczniki/2016/005_ROS_V18_R2016.pdf		The study was to determine the energy consumption of the pressure agglomeration process of dry apple pomace, and selected physicochemical properties of compressed material. Apple pomace is a by-product of fruit and vegetable processing, and it constitutes biodegradable waste. Small quantities of pomace are not harmful to the environment, but large amounts of waste could pose a problem for processing plants. Pressed pomace can be used in industrial processing and power generation.	Apple pomace innovation	This paper presents the methodology and the results of analyses investigating the properties of apple pomace and its manage- ment scenarios

SCALE UP
community-driven
bioeconomy development

SCALE-UP Information Package

T2.4 Review and preparation of existing scientific and technological information supporting bio-based solutions

Region:	Strumica
Organization:	SDEWES-Skopje
Biomass stream/value chains:	Composting
Bio-based solutions:	Providing service and organising primary and secondary bio-based residues

This information package aims at reviewing and collecting information relevant to the SCALE-UP project and for the regional platforms. Relevant studies should aim at supporting the bio-economy rollout in the SCALE-UP regions and of the specific bio-based solutions.

Information on the following topics will be gathered:

1. EU Policies and legislation
2. Research projects
3. Local policies
4. Technical Information on specific biobased solutions
5. Biomass availability & Nutrient recycling

1. EU Policies & Legislation

Please add the EU policies and legislation that you find relevant to the SCALE-UP project and for your bio-based solution.

Other sources of interest: JRC Knowledge Centre for Bioeconomy (English) JRC Knowledge Centre for Bioeconomy (Macedonian)

List of important EU policies and legislation

	Date of adoption	Name	Link	Translation link (English -> Macedonian)	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	20.9.2021	**EU Instrument for PreAccession - Rural Development Programme 2021-2027**	https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R1529	-	IPA is aiming at (1) enhancing farm viability and competitiveness of agriculture and food processing (2) restoring, preserving and enhancing ecosystems dependent on agriculture, fishery and forestry (3) promoting balanced territorial development in rural areas (4) transfer of knowledge and innovation in agriculture, forestry and rural areas	IPARD focuses specifically on rural areas and agri-food sectors of countries in the process of joining the EU. It can strengthen the competitiveness and viability of the agri-food sectors by building an agriculture capable of competing with market forces, ensure sustainable management of natural resources, and increase resilience to climate change.	The framework sets the ground for enhancing investments for rural development.
2	09.03.2022	**Third IPARD Programme for the period 2021-2027**	https://ipard.gov.mk/en/announcement/the-european-commission-has-approved-the-ipard-programme-2021-2027/	https://ipard-gov-mk.translate.goog/en/announcement/the-european-commission-has-approved-the-ipard-programme-2021-2027/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	IPARD III is oriented to: 1. enhance farm viability and competitiveness of agriculture and food processing - for all types of agricultural and primary food-processing, while progressively aligning with the EU food safety standards, animal welfare and environmental requirements and improving the level of modernisation and technology use. 2. restore, preserve and enhance ecosystems dependent on agriculture, fishery and forestry - focused on promoting the use of environmentally friendly farming practices, protection and enhancement of biodiversity, landscape, water and soil, within high nature value and traditional agrarian areas, as well as mitigation of climate change. 3. promote balanced territorial development in rural areas - aiming to increase the employment possibilities, to create alternative income sources for rural population and to enhance the attractiveness of rural areas through improved living conditions, security of life and private property. 4. transfer knowledge and innovation in agriculture, forestry and rural areas - foreseen to strengthen human capital within rural areas and thereby to address the problem of narrow scope and insufficient training, and lack of information. For the new IPARD 2021-2027, the indicative European Union contribution has been set at EUR 97 million. About two-thirds of the funds are planned for M1 (Investments in physical assets of agricultural holdings) and M3 (Investments in physical assets concerning processing and marketing of agricultural and fishery products), and the remaining funds are planned for M4 (Agri-environment – climate and organic farming).	The IPARD Programme 2021-2027 is a program document that defines the measures and policies of rural development which are also in the focus areas of SCALE-UP. Thus, the total financial support (EU budget) for all measures of the Programme is 97 million euros.	The programme can financially support the bio-based solutions selected for Strumica, thus related to composting, if there is interest from the entrepreneur to apply, after the SCALE-UP innovative support programme is completed and the business models are market-ready.

3	02-2012	**EU bioeconomy strategy**	https://op.europa.eu/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478	https://op-europa-eu.translate.goog/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	The 2012 European Bioeconomy Strategy paved the way for a more innovative, resource-efficient and competitive society that reconciles food security with the sustainable use of renewable resources for industrial purposes, while ensuring environmental protection. A comprehensive review concluded that it has been a success, notably at mobilising research and innovation, boosting private investments, developing new value chains, promoting the uptake of national bioeconomy strategies and involving stakeholders.	The EU bioeconomy strategy aims at strenghtening and scaling-up bio-based sectors, as well as deploying local bioeconomies across Europe. Through: -The deployment of the bioeconomy will lead to the creation of jobs, especially in rural areas through the growing participation of primary producers in local bioeconomies. -The bioeconomy strategy sets as one of its main goals to support research and innovation and deployment of innovative solutions for the production of new and sustainable bio-based products. -A Strategic Deployment Agenda will be developed, which will provide a long-term vision on pathways to deploy and scale up the bioeconomy in a sustainable and circular manner. -Enhance synergies between existing EU instruments to support local activities. -CAP to support bioeconomies in rural areas.	Relevant to the specific bio-based solutions: -It aims at increasing the availability of secondary materials (such as feed and biowaste) for further exploitation through conventional technologies (e.g. composting and anaerobic digestion) and innovative ways of extracting valuable substances. Innovation is expected to support markets for bio-based products, where one industry's waste becomes the starting material for another. -It addresses new opportunities for the forestry sector, where non-sustainable raw materials in various sectors are replaced with forestry-based materials and chemicals. -Biowaste and residues can be used as valuable resources and can help reduce food waste by 50% by 2030.
4	2019	**European Green Deal**	https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/european-green-deal_en?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	European Green Deal is a set of comprehensive and integrated to transform the EU into a modern, resource-efficient and competitive economy, ensuring no net emissions of green house gases by 2050 and economic growth decoupled from reseource use.	The Green Deal includes measures in agriculture on the reduction of environmental and climate foodprint and increase of competative sustainablility from farm to fork (see below). In the energy sector the Green Deal includes measures to promote eco design of products en renewable energy from sustainable biomass resources.	
5		**European Digital Strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	The EU's digital strategy aims to make this transformation work for people and businesses, while helping to achieve its target of a climate-neutral Europe by 2050.	EU's digital strategy recognises that digital technologies are profoundly changing our world, and generate an ever-increasing amount of data, which if pooled and used properly, can lead to completely new means and levels of value creation, leading towards more sustainable solutions which are resource-efficient, circular and climate-neutral.	Real time tracking, new, added-value creations, interconnections, boosting bio-based solutions driven by new, high and/or deep technologies
6	02-2020	**European data strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	The European data strategy aims to make the EU a leader in a data-driven society. Creating a single market for data will allow it to flow freely within the EU and across sectors for the benefit of businesses, researchers and public administrations.	The EU is creating a single market for data where data can flow within the EU and across sectors, for the benefit of all European rules, in particular privacy and data protection, as well as competition law, are fully respected the rules for access and use of data are fair, practical and clear	By having more information, consumers and users such as farmers, airlines or construction companies will be in a position to take better decisions such as buying higher quality or more sustainable products and services, thereby contributing for example to the Green Deal objectives.

7	01-2023	**Common Agricultural Policy (CAP) CAP 2023-27**	https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-glance_en#cap2023-27	https://agriculture-ec-europa-eu.translate.goog/common-agricultural-policy/cap-overview/cap-glance_en?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=en-US&_x_tr_pto=wapp#cap2023-27	The CAP 2023-2027 must be oriented more than ever to respond to the specific needs of the agricultural sector and rural areas in terms of equity, distribution of support, instruments and characteristics, after the serious health crisis caused by COVID. To achieve these objectives, the CAP is focusing on innovation, CAP Strategic Plans (in line with the objectives and targets of the "Green Deal"), giving the EU a greener and fairer CAP.	The CAP 2023-2027 includes "support for rural development" as one of its focal points through the development of a wide range of tools including: Funding for investment, knowledge creation, innovation and cooperation will in many cases be targeted at environmental and climate-related needs, but will also serve other CAP objectives.	Within the CAP 2023-2027, it is indicated that the improvement of existing requirements is also a necessary condition for the improvement of agricultural sustainability, for this purpose, measures are proposed to improve soil health in the long term, so farmers are required to carry out beneficial crop rotations (among other measures). On the other hand, a wide range of types of action are proposed, including ecosystems that support voluntary actions related to better nutrient management, agroecology, agroforestry, carbon farming or animal welfare (among others).
8	05-2020	**Farm to Fork strategy**	https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en	https://food-ec-europa-eu.translate.goog/horizontal-topics/farm-fork-strategy_en?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=en-US&_x_tr_pto=wapp	The Farm to Fork Strategy is a set of measures to accelerate the transition to a sustainable food system that should have a neutral or positive environmental impact help to mitigate climate change and adapt to its impacts, reverse the loss of biodiversity ensure food security, nutrition and public health, making sure that everyone has access to sufficient, safe, nutritious, sustainable food preserve affordability of food while generating fairer economic returns, fostering competitiveness of the EU supply sector and promoting fair trade.	The Farm to Fork Strategy includes measures to promote sustainable food production and processing (including nutrient recycling). This includes measures on the compatativeness of the EU food supply sector including use of residues for bioproducts	

2. Research Projects

Please add Interreg, Horizon 2020, Horizon Europe projects, and other projects that you find relevant to the SCALE-UP project and for your bio-based solutions.

Other sources of interest:	JRC Knowledge Centre for Bioeconomy (English)	JRC Knowledge Centre for Bioeconomy (Macedonian)

List of relevant projects

	Start month	End month	Name	Project website	Translation link (English to Macedonian)	Project summary	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions	Activities of interest	Comments
1	09-2022	08-2025	**MainstreamBIO**	https://mainstreambio-project.eu/	https://mainstreambio--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	MainstreamBIO sets out to get small-scale bio-based solutions into mainstream practice across rural Europe, providing a broader range of rural actors with the opportunity to engage in and speed up the development of the bioeconomy. Regional Multi-actor Innovation Platforms (MIPs) will be established in 7 EU countries (PL, DK, SE, BG, ES, IE and NL) to enhance cooperation among key rural players towards co-creating sustainable business model pathways in line with regional potentials and policy initiatives.	Innovation support services,Decision Support System, Multi-actor Innovation Platforms, Digitalisation and Practice abstracts.	Some cases related with our 12 bio-based solutions (potential exchange of good practices and Knowledge)	WP4, WP5	SCALE-UP sister project
2	10-2022	09-2025	**RuralBioUp**	https://www.ruralbioup.eu/	https://www-ruralbioup-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	RuralBioUp will strengthen the cooperation among regional key actors and knowledge holders, empowering them to establish an inclusive and long-lasting ecosystem (the RuralBioUp Regional Hubs) to support the mainstreaming of bio-based business models in rural areas. In particular, RuralBioUp will establish 9 Regional Hubs in 6 EU countries, that will co-design and implement 9 Action Plans on 18 value chains.	9 regional hubs (one multi-stakeholder hub) are established in 6 EU countries (France, Romania, Czech Republic, Ireland, Latvia and Italy). 9 Action Plans will be implemented in 18 value chains.	Biomass value chain development: Biomass logistic, Valorisation, Communities. Lessons learnt	WP4, WP5	SCALE-UP sister project
3	09-2022	08-2025	**BioRural**	https://biorural.eu/	https://biorural-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	BioRural's goal is to create a European Rural Bioeconomy Network to promote small-scale bio-based solutions in rural areas and support the transition towards a sustainable, regenerative, inclusive and just circular Bioeconomy across all Europe at local and regional scale.	BioRural focusses on EU-level developments, it does not feature any regional case studies.	Rural Bioeconomy Alliance. Network. Cooperate to promote the currently available small-scale bio-based solutions		SCALE-UP sister project
4	04-2019	07-2022	**BE-Rural**	https://be-rural.eu/	https://1-be--rural-eu.translate.goog/?_x_tr_enc=1&_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	BE-Rural aimed at exploring the potential of regional and local bio-based economies and support the development of bioeconomy strategies, roadmaps and business models. To this end, the project focused on establishing Open Innovation Platforms (OIPs) within selected regions in five countries: Bulgaria, Latvia, North Macedonia, Poland and Romania.		Case study in North Macedonia (focussing on Mycelium-based packaging and insulation material); Case study in Latvia (foussing on wood wool)	D5.1 "Briefing paper: Analysing market conditions and designing business models within BE-Rural's OIPs"; D5.2 "Summary report on small-scale bio-based business models and their market potentials"; D5.4 "Note on the development of a sustainability screening for regional bioeconomy strategies"	Power4Bio sister project
5	10-2018	03-2021	**POWER4BIO**	https://power4bio.eu/	https://power4bio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	POWER4BIO project aimed at empowering regional stakeholders to boost the transition towards bioeconomy regions in Europe by providing them with the necessary tools, instruments and guidance to develop and implement sound sustainable bioeconomy strategies. POWER4BIO targeted 10 regions with a focus on regions in Central and Eastern Europe.		Case study in Andalusia (focussing on Bioeconomy Strategy and Available Biomass Sources At Regional Level (Olive Biomass, Intensive Horticulture and Seaweed production)) and Mazovia (agricultural residues)	D3.3 "Catalogue with bio-based solutions"; D6.4 "Training design and materials for increasing the bioeconomy capacity of regional stakeholders"	BE-Rural sister project; certain outputs related to the development of bio-based solutions were classified as confidential and are thus not publicly available.

Other relevant projects								
	Start month	End month	Name	Project website	Translation link (English to Macedonian)	Project summary	Relevance to SCALE-UP	Comments
1	09-2022	08-2025	**ShapingBio**	https://www.shapingbio.eu/	https://www-shapingbio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	The overall aim of ShapingBio is to support and accelerate bioeconomy innovation and the deployment of new knowledge in the EU and its member states. ShapingBio aims to provide evidence-based and concrete information and recommendations for better policy alignment and stakeholder actions to realize the cross-sectoral potential of the bioeconomy and to reduce the fragmentation across bio-based sectors and food system and policies across regions, domains and governance levels.	Promote innovation in the EU bioeconomy.	ShapingBio focusses on EU macro-regions, it does not feature any rural case studies.
2	07-2022	06-2025	**BioModel4Regions**	https://www.biomodel4regions.eu/	https://www-biomodel4regions-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	BIOMODEL4REGIONS aims to support the establishment of the innovative governance models at local/regional level to achieve better-informed decision-making processes, social engagement and innovation to support and strengthen EU and international science-policy interfaces to achieve the Sustainable Development Goals.	Support regional bioeconomies.	
3	09-2022	08-2025	**CEE2ACT**	https://www.cee2act.eu/	https://www-cee2act-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	CEE2ACT will empower countries in Central Eastern Europe and beyond to develop circular bioeconomy strategies and action plans through knowledge transfer and innovative governance models enabling sustainability and resilience to achieve better informed decision-making processes, societal engagement and innovation, building on the practice of experienced countries serving as role models.	Development of bioeconomy strategies.	CEE2ACT focusses on national-level developments, it does not feature any regional/rural case studies.
4	09-2022	08-2025	**ROBIN**	https://robin-project.eu/	https://robin--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	ROBIN aims to empower Europe's regions to adapt their governance models and structures in ways that accelerate the achievement of their circular bioeconomy targets while promoting social innovation and accounting for different territorial contexts. In this context, ROBIN will support 5 regional authorities across Europe (Southern Region of Ireland, Central Macedonia, Andalusia, Baden-Wuerttemberg, Zilina) to adapt their governance models to support the scaling up of the bio-based value chains of their ecosystem.	Regional bioeconomy development, as well as social innovation in the bioeconomy, which is covered in WP5 of SCALE-UP.	
5	06-2022	05-2025	**RELIEF**	https://relief.uop.gr/	https://relief-uop-gr.translate.goog/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	RELIEF aims to develop and deliver an innovative approach for teaching bio-economy in farming, by developing specific learning resources addressing HEIs students and farming practitioners. RELIEF will deliver a training needs analysis and develop two curricula in bio-economy, for HE students, farming practitioners and farmers exploring the key areas that are critical for the implementation of business models and strategies towards bio-economy in farming.	Training courses on bioeconomy, also covered in WP3 of SCALE-UP.	
6	01-2021	06-2023	**COOPID**	https://coopid.eu/	https://coopid-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	Wtin COOPID, a network of bioeconomy clusters from 10 European countries has been created, involving a range of stakeholders: primary producers, in cooperatives or associations, within agriculture, forestry and aquaculture; industry; public sector; research and academia. So-called COOPID ambassadors showcased success stories, organised workshops and conducted interactive dissemination and communication campaigns. The focus was on the uptake of sustainable bio-based business models in the primary production sector.	Development of bioeconomy clusters.	D4.2 "Success story factors for biobased Business models"
7	12-2022	11-2026	**P2GreeN**	https://p2green.eu/	https://p2green-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	P2GreeN will implement and demonstrate innovative N & P recovery solutions based on human sanitary waste from urban settlements and its conversion into safe bio-based fertilisers for agricultural production. The project will test the solutions in three pilot regions on a north-south trajectory.	Nutrient recovery is a part of SCALE-UP.	

3. Regional, National & Local policies

Please add the local policies (including strategies, roadmaps, incentives, subsidy schemes and regulatory information) that you find relevant to the SCALE-UP project and to your bio-based solutions.

List of relevant policies

	Year	Regional/Provincial/National	Title	Title (original language)	Link	Translation link (Macedonian -> English)	Author/Publisher:	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	2017	National	**Law on agriculture and rural development**	**Закон за земјоделство и рурален развој**	https://zpis.gov.mk/Upload/Documents/Zakon%20za%20zemjodelstvo%20i%20ruralen%20razvoj%20mart%202017.pdf	-	Ministry of Agriculture, Forestry and Water Management	The Law on agriculture and rural development regulates the planning of agricultural and rural development, the goals of the national agricultural policy, partnership with social and economic partners, support of agricultural markets and national financial support	This law regulates the planning of agricultural and rural development on national level and it is fondation for all plans and programmes related to agriculture.	The document aims at improving the conditions for composting and strengthening the multi-sector partnership.
2	2022 (latest changes)	National	**Law on Agricultural Land**	**Закон за земјоделско земјиште**	https://diz.gov.mk/wp-content/uploads/2021/01/ЗАКОН-ЗА-ЗЕМЈОДЕЛСКО-ЗЕМЈИШТЕ.pdf	-	Ministry of Agriculture, Forestry and Water Management	This law regulates the use, disposal, protection and conversion on agricultural land. The objectives are: rational use of agricultural land as limited natural resource, protection of agricultural land and provision of legal certainty to owners and users of agricultural land.	This law regulates the various aspects on agricultural land, important for the sustainability aspect.	The document provide meaures and suggestions for proper soil fertilization.
3	2021 (latest changes)	National	**Law on Organic Agricultural Production**	**Закон за органско земјоделско производство**	https://diz.gov.mk/wp-content/uploads/2021/01/ЗАКОН-ЗА-ОРГАНСКО-ЗЕМЈОДЕЛСКО-ПРОИЗВОДСТВО.pdf	-	Ministry of Agriculture, Forestry and Water Management	This law regulates the production, preparation, processing, storage, transport, distribution, advertising, the sale, labeling and control of organic products where they are organic production methods used.	This law regulates the various aspects on organic production, important for the potential organic residues quantity.	The document gives recommendation for organic production and its beneficial usage.
4	2021 (latest changes)	National	**Law on quality and safety of fertilizers, biostimulants and improvers of soil properties**	**Закон за квалитет и безбедност на ѓубриња, биостимулатори и подобрувачи на својствата на почвата**	https://www.mzsv.gov.mk/CMS/Upload/ЗАКОН%203А%20КВАЛИТЕТ%20И%20БЕЗБЕДНОСТ%20НА%20ЃУБРИЊА,%20БИОСТИМУЛАТОРИ%20И%20ПОДОБРУВАЧИ%20НА%20СВОЈСТВАТА%20НА%20ПОЧВАТА/Закон%20за%20квалитет%20и%20безбедност%20на%20ѓубриња,%20биостимулатори%20и%20подобрувачи%20на%20својствата%20на%20почвата.pdf	-	Ministry of Agriculture, Forestry and Water Management	This law regulates the conditions for the production of fertilizers, its placement on the market, import, export and use of fertilizers, biostimulators and improvers of soil properties, manure types, identification, quality, composition, sampling, packaging, repackaging, marking, testing, declaring, tracking, registering and other issues related to biostimulators and improvers of soil properties.	This law regulates the various aspects on fertilizers, imporant for identification of bio-alternatives for composting.	The document sets the rules and criteria for organic fertilizers.
5	2020 (latest changes)	National	**Law on Waste Management**	**Закон за управување со отпадот**	https://www.moepp.gov.mk/wp-content/uploads/2018/12/ЗАКОН-ЗА-УПРАВУВАЊЕ-СО-ОТПАД-МКД.pdf	-	Ministry of environment and physical planning	This law regulates the principles and objectives of waste management, strategies, the plans and programs for waste management, the rights and obligations of the legal and natural persons in relation to waste management, the manner and conditions under which it can to collect, transport, reuse, treat, store, processing and disposal of waste, import, export and transit of waste, establishment of the information system, as well as financing and supervision over waste management	This law regulates the principles and objectives of waste management, imporatant for the reduction of bio-residues and enchancing organic waste separation and selection.	The document provide instructions for proper waste management including recycling/improving the properties of organic substances that are not use as solvents (including composting and other processes of biological transformation).

6	2022 (latest changes)	National	**Law on Environment**	**Закон за животна средина**	https://www.moepp.gov.mk/wp-content/uploads/2014/10/Закон-за-животната-средина-пречистен-текст.pdf	-	Ministry of environment and physical planning	The objectives of this law are: preservation, protection, renewal and improvement of the quality of enviroment; protection of human life and health; protection of biological diversity; rational and sustainable use of natural resources and implementation and improvement of the measures to solve the regional and global environmental problems.	This law regulates the principles and objectives of environment preservation, setting the measures to reduce the GHG emissions and conserving the biodiversity on national and local level.	This document aims at strengthening the sustainable and circular approach of the selected bio-based value.
7	2021	National	**National Strategy on agriculture and rural development for the period 2021-2027**	**Национална стратегија за земјоделството и руралниот развој за периодот 2021-2027**	https://faolex.fao.org/docs/pdf/mac209144.pdf	-	Ministry of Agriculture, Forestry and Water Management	This Strategy, based on the provisions of the national Law on agriculture and rural development, represents a main long-term strategic document on which is based the setting and implementation of goals, policies and measures for the development of agriculture and rural areas in the Republic of North Macedonia for the period from the year 2021 until 2027, with the aim of planning the national agricultural policy in order to achieve related legally defined sectoral development goals. This text reflects the continuity of the state interest in agriculture due to its multidimensional importance and especially for ensuring the sustainability of rural areas.	The strategy is setting the national agricultural policy and measures aligned with the EU requirements.	This document gives an overview of various mitigation measures for climate changes, among which are the usage of non-artificial fertilizers.
8	2019	National	**Communication and visibility plan of the rural development network of the Republic of North Macedonia for period 2019-2022**	**План за комуникација и видливост на мрежа за рурален развој Република Северна Македонија**	https://ruralnet.mk/File_Storage/bfd662a2-6f36-49a8-b675-31efb033f2bb_Plan-za-komunikacija-na-MRR-2019-2022.pdf	-	Ministry of Agriculture, Forestry and Water Management	The purpose of the Networks for Rural Development is the exchange of information, easier distribution of information, communication, easy availability of all information to all actors of the rural development in an equal way and at the same time, all because of the complexity of this area and the different character and type of actors (interested subjects) of rural development.	This plan is enchancing the stakeholders networking in the agricultural sector, thus contributing to the engagement in the Quadruple Helix.	This document provide guidline for networking and knowledge exchange between stakeholders, primary producers and businnes sector.
9	2023	Local	**Local Environmental Action Plan (LEAP) for the Municipality of Strumica 2024-2029**	**Локален акционен план за животна средина 2024 - 2029 година**	https://strumica.gov.mk/leap/	https://strumica-gov-mk.translate.goog/leap/?_x_tr_sl=mk&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	Municipality of Strumica	The main regulatory instrument relevant to bioeconomy development in the Strumica region is the LEAP under jurisdiction of the Ministry of Environment and Physical Planning and the Law for environment. Issued in 2023, this plan has a six-year timeframe and supports compliance with environmental requirements in the process of accession to the EU.	This plan has a six-year timeframe and supports compliance with environmental requirements in the process of accession to the EU.	This document encourages the use of organic biomass residues from agriculture for production of compost or energy resources;
10	2022	National	**Report on the Status of Organic Agriculture and Industry in North Macedonia**	**Извештај за статусот на органското земјоделско и индустрија со Северна Македонија**	http://www.ekoconnect.org/tl_files/eko/p/Projekte/MOE-Laenderberichte/Country-Report-Organic-NORTH-MECEDONIA-EkoConnect-2022.pdf	-	Association of Agricultural Economists of North Macedonia	Report on various aspect of organic farming. Organic farming in North Macedonia is an emerging sector. With suitable climate and soil conditions, North Macedonia has a significant potential in organic crop production, wild collection, sheep breeding, and beekeeping. Processing is still limited and the market needs to be further developed.	This report complies with the Law on organic production. It provides data for various organic production, their challenges and outlook. Moreover it contains an overview for organic-relevant companies, stakeholders, and products.	This document emphasizes the greater need to introduce the sustainable and organic farming in the education and research sector.
11	2018	National	**National Program for Agricultural Development and Rural Development 2018-2022**	**Национална програма за развој на земјоделството и рурален развој 2018 - 2022**	https://dejure.mk/zakon/nacionalna-programa-za-razvoj-na-zemjodelstvoto-i-ruralen-razvoj-za-period-od-2018-2022-godina	https://dejure-mk.translate.goog/zakon/nacionalna-programa-za-razvoj-na-zemjodelstvoto-i-ruralen-razvoj-za-period-od-2018-2022-godina?_x_tr_sl=mk&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	Ministry of Agriculture, Forestry and Water Management	Operational document for implementing the national policy for agriculture and rural development that connects strategic policy documents, primarily NARDS and multi-year budget planning, with annual operational programs. Overview on the: (1) instruments, measures and activities for their implementation, (2) timetable and deadlines for implementation and (3) indicative financial framework for their implementation. Validity period 2018-2022. Frequently updated.	This programme is operational document for implementing the national policy for agriculture and rural development that connects strategic policy documents, and multi-year budget planning, with annual operational programs	This document complements the National Strategy and indicates potential financial support for rural development.

12	2018	National	**National strategy for biological diversity with action plan for the period 2018 – 2023**	**Национална стратегија за биолошка разновидност со акциски план за периодот 2018 – 2023 година**	https://www.moepp.gov.mk/wp-content/uploads/2014/12/NATIONAL-BIODIVERSITY_MKD.pdf	-	Ministry of environment and physical planning	The document explores North Macedonia's biodiversity, starting with global and national strategies, emphasizing periodic strategy revisions. Analyzing geographical, climatic, and demographic features, it delves into species diversity, ecosystems, and genetic variety, emphasizing the country's regional significance. Turning to challenges, it dissects direct threats, including agriculture and transportation. The positive feedback loop of ecosystem services is introduced. Examining institutional aspects, the document reviews legal frameworks, stakeholders, and financing. Legal safeguards for species, habitats, and designated areas are outlined. The documents provide concise strategic plan with national goals, objectives, and targets. In essence, it offers a brief technical narrative of Macedonia's biodiversity and outlines a strategic path forward.	This document provide overview of the biodiversity on national level, which is one of the main aspeacts condiserated in the project	The focus on nature conservation must involve integrating sustainable development principles into other sectoral policies. This entails identifying mechanisms and alternatives that won't significantly delay planned economic growth. Such measures contribute to ensuring the long-term survival of crucial components of biological diversity, both nationally and internationally. Based on the analysis of threats, some of the key sectors affecting biodiversity are agriculture and forestry.
13	2013	National	**National plan for organic production 2013 - 2020**	**Национален план за органско производство 2013-2020**	http://arhiva.mzsv.gov.mk/files/Nacionalen%20Plan%20za%20Organsko%20Proizvodstvo_2013%20-%202020.pdf	-	Ministry of Agriculture, Forestry and Water Management	This document presents a chronological overview of the development process of the National Organic Production Plan for 2013-2020. It covers the document's objective and structure, assesses the current state and macroeconomic framework, examines the historical development of organic production, and evaluates the implementation of strategic goals. The sectoral analysis encompasses plant production, education, trade, raw materials, processing of organic products, livestock production, control and certification, policy, legislation, and the collection of wild plants and fruits. Furthermore, it gives details on the organic production strategy and the action plan for the period 2013-2020.	This document provide an overview of the organic development plan on national level, thus it delve depeer in the organic producs, need for certifications, etc.	This document could be of improtance for the quality of the agricultural residues, thefore for the quality of the composts and fertilizers.

4. Technical information on specific bio-based solutions

Please add technical information, including scientific information, peer-reviewed articles, reports, and other data or research that you find relevant to the bio-based solutions.

List of relevant technical information

Solution 1: Composting

Solution 2: Agricultural residues and mycelium-based inslulation and packaging solutions

	Date	Author(s)	Title	Link	Translation link (English -> Macedonian)	Organizations	Summary of contents	Relevant to which solution?	Why is it relevant?
1	2017	Centre for development of the South-East region	Study for analysis of composting potentials in domestic conditions in the South-East planning region	https://keep.eu/api/project-attachment/16145/get_file/	-	Centre for development of the South-East region	The study on "Analysis of the potentials of composting in the South-East region" was made within the framework of the project "We are thinking about composting - dedicated to maintaining the organic chain".The purpose of the Study is to investigate, analyze and consider the potentials, but also the challenges for composting organic (biodegradable) waste in domestic conditions, but also at the local level for the municipalities in the Southeast region. The study contains information about the current state of composting in our country, the benefits of composting as a process, and the use of the produced compost.The study also investigates the technical-technological and financial viability, sustainability of composting and suggests future steps needed to prepare the competent municipal authorities and other stakeholders to comply with the requirements of the national legislation in the field of waste management.	Composting	The document gives an extensive overview of region and status quo with the biodegradable waste. It tackles several issues related to waste management such as: residues from vegetable agricultural production, disposal, and available technologies for the treatment of biodegradable waste, types of composting and waste treated by composting. Furthermore, it provides a content of the legal framework and assessment of the potential in the region with possible variants for composting and most suitable composting system. Nonetheless, the study focuses on the sustainability of composting in the region.
2	2008	Liljana Koleva-Gudeva, Dragi Janev	From organic waste to organic compost	http://arhiva.mzsv.gov.mk/files/Brosura_Kompostiranje.pdf	-	Program for Regional economic development in North Macedonia	This study is answering many questions regarding compost, such as why should we compost, what is composting, what does it take to make compost, what is compostable or not, difference between cold and ward composting, good composting site, how is a compost mixture formed, types of composters, necessary conditions for obtaining compost, the most important rules for successful composting , their stages. The documents elabotates about home composting, composting using worms or lumbriculture and finally what is the benefit of composting.	Composting	This document provides the basis on the composting issue, i.e., what it takes to make compost, what is or not compostable, cold, and warm composting, composting sites, types of composters, necessary conditions for obtaining compost, etc. Moreover, it elaborated the stages in composting and ripening of the compost. Also, the study highlights the use of compost and its benefits.
3	2017	Munipality of Strumica	Plan for management waste in Municiplaity of Strumica for period 2017-2022	https://strumica.gov.mk/wp-content/uploads/2020/07/Општински-план-за-отпад-2017-2022.pdf	-	Munipality of Strumica	Waste is one of the main environmental problems taking into account that the amounts of waste are constantly increasing. Most of the waste in the North Macedonia is deposited at the legal and the illegal.Waste recycling in the North Macedonia is very little represented. There should be certain goals in relation to waste and increase of integrated waste management, effective institutional and organizational set-up and improved waste management infrastructure. Priorities in waste management are the following: Avoiding the generation of waste and reducing harmful impacts; Improvement of production technologies which reduces the generation of waste and the use of ecological products and less packaging, Recycling and reuse of waste or in another process for extraction of secondary raw materials or to be used as a source of energy. Mainly the generation of waste comes from production activities, from quarries and mines, from construction, waste from agriculture and forestry, municipal waste, etc. Waste from production and processing activities consists mainly of food, wood, paper, chemicals, non-metallic minerals, base metals,etc. Production and processing activities can play a central role in reducing the amount of generated waste with: Incorporating life cycle analyzes into design and production of goods and services, Promotion of sustainable use of matter and energy, Elimination or reduced use of substances and materials that are dangerous for human health and the environment.	Composting	This document focuses on the waste management in the municipality of Strumica, with a overview of the different waste type management, waste collection and transport. More importantly, this plan identifies the barriers that exist on local level in order to enhance waste management, thus defines measures and projections for future waste generation. The plan provides guidelines for waste selection and instructions for reduction of generated waste, reuse, treatment and composting of the waste.

4	2022	Liucheng Penga et al.	**Development and characterization of mycelium bio-composites by utilization of different agricultural residual byproducts**	https://www.sciencedirect.com/science/article/pii/S2369969822000731	https://www-sciencedirect-com.translate.goog/science/article/pii/S2369969822000731?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	College of Food Science and Technology, Shanghai Ocean University, Shanghai 201306, China	Mycelium bio-composites was developed by incubating Pleurotus ostreatus fungi on different substrates from agricultural residual byproducts, including rice straw, bagasse, coir-pith, sawdust, and corn straw. The scanning electron microscope (SEM) results showed that the hypha of composite derived from bagasse was the densest, and the diameter of hypha was the biggest (0.77 μm), which was presumably due to the existence of cellulose in bagasse in the form of dextran and xylan. The maximum and minimum compression strength for sawdust substrate and corn straw substrate were 456.70 and 270.31 kPa, respectively. The flexural strength for bagasse substrate and rice straw substrate were 0.54 and 0.16 MPa, respectively. The two composites derived from rice straw and bagasse exhibited higher hydrophobic properties than others. In comparison, mycelium bio-composite derived from bagasse showed the best comprehensive properties. Except for a little worse anti-creep ability and waterproof performance, other properties of mycelium biocomposites could be comparable to commercially expanded polystyrene (EPS) packaging material. Derived from this study, mycelium material provided a good way to use agricultural residual byproducts and could be a good alternative to non-biodegradable materials for packaging applications.	Agricultural residues and mycelium-based insulation and packaging solutions	This document provided in depth analysis of different types of agricultural residues with their technical properties, significant for selection of the residues available in the region.
5	2020	Kshitij Joshi et al.	**Fabrication and Characterization of Bioblocks from Agricultural Waste Using Fungal Mycelium for Renewable and Sustainable Applications**	https://www.researchgate.net/publication/339572951_Fabrication_and_Characterization_of_Bioblocks_from_Agricultural_Waste_Using_Fungal_Mycelium_for_Renewable_and_Sustainable_Applications	https://www-researchgate-net.translate.goog/publication/339572951_Fabrication_and_Characterization_of_Bioblocks_from_Agricultural_Waste_Using_Fungal_Mycelium_for_Renewable_and_Sustainable_Applications?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp&_x_tr_hist=true	Indian Institute of Technology Roorkee Mukesh Kumar Meher	Recent advances in the field of biomaterials and an ever-growing need to curb the alarming rate of pollution levels have led to the utilization of biodegradable waste to fabricate sustainable materials with tunable properties. The current study investigated the growth kinetics and morphology of Pleurotus ostreatus (P. ostreatus) mycelium grown on different agricultural wastes such as wheat bran, sugarcane, sawdust, and the mixture of these substrates. Further, it delineated the fabrication process of biodegradable “bioblocks” from such agricultural waste using a green synthesis approach and mycelium P. ostreatus as a natural adhesive material. The fabricated bioblocks showed excellent thermal stability, hydrophobic properties, and mechanical strength. The compressive strength of these bioblocks was approximately 6.0–7.5 N/mm2 , which is 5–6 times higher than that of the routinely used polystyrene packaging material. These properties of the bioblocks render them fit to replace the non-biodegradable materials that are commonly used in packaging applications, wall paneling, and filtration of toxic wastes	Agricultural residues and mycelium-based insulation and packaging solutions	This document analysis the sustainable applications with the mycelium and agricultural resides combination. It is vital for choosing the proper application relevant to the market needs in the region.
6	2021	Institute of Agriculture, Faculty of Agricultural Sciences and Food, Hans Em Faculty of Forest Sciences, Landscape Architecture and Environmental Engineering	**Climate change vulnerability and adaptation agriculture, forestry and land use**	https://api.klimatskipromeni.mk/data/rest/file/download/7e77d1acb9ea1677e56fb75cfbefd79b7d97f2b26ed0177fc4e02aebcfc011a1.pdf	-	Ss. Cyril and Methodius University in Skopje	The Sectoral Report on Agriculture and Forestry for North Macedonia's Fourth National Plan on Climate Change offers a concise overview of the current status and challenges in the agricultural and forestry sectors. It addresses crucial elements such as GHG emissions scenarios, vulnerability assessments, and adaptation strategies. The report examines the demographic landscape of the agricultural sector, including depopulation and aging issues, along with a focus on education. Climate change impacts on agriculture, from temperature fluctuations to extreme weather events, are analyzed, emphasizing soil vulnerability. In addition to agriculture, the report extends its insights to livestock vulnerability, featuring a case study on cattle, and evaluates the impact of climate change on the forestry sector, covering forest fires, ecosystem services, and forest management. The economic aspects of vulnerability, particularly in soil and crop sectors, are explored through sustainable irrigation and cover crops economics case studies. The report concludes with a summary of recommended adaptation measures, stressing the importance of implementing national policies related to climate change in the agricultural sector. It serves as a comprehensive guide for policymakers in formulating effective climate change mitigation and adaptation strategies in North Macedonia's agricultural and forestry domains.	Composting	This document is very relevant to the SCALE-UP project, as it provides essential insights into climate change impacts, adaptation measures, and economic aspects, offering a valuable resource for regional actors aiming to overcome bioeconomy bottlenecks, enhance capacity, and promote sustainable transitions in their regions.
7	\	Ministry of Agriculture, Forestry and Water Management	**Database of the unified register of agricultural holdings**	https://app.powerbi.com/view?r=eyJrIjoiYzEzYzYwODAtZDAzMy00YzU1LWI1YTMtNTc0ZmE2MjM3ZmEwIiwidCI6IjgwY2NjMDM5LTg0NWQtNDA4Zi1iYmU5LWVhNGZhM2I4ZjkwOSIsImMiOjh9	https://app-powerbi-com.translate.goog/view?r=eyJrIjoiYzEzYzYwODAtZDAzMy00YzU1LWI1YTMtNTc0ZmE2MjM3ZmEwIiwidCI6IjgwY2NjMDM5LTg0NWQtNDA4Zi1iYmU5LWVhNGZhM2I4ZjkwOSIsImMiOjh9&_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=nl&_x_tr_pto=wapp	Ministry of Agriculture, Forestry and Water Management	The Unified Register of Agricultural Holdings, managed by the Ministry of Agriculture, Forestry, and Water Management, provides a comprehensive database for each of the municipalities in North Macedonia, including the municipality of Strumica. It includes information on the number of registered agricultural holdings, the quantity and area of cadastral plots, and the sizes of farms within the region. This database serves as a valuable resource for monitoring and managing agricultural activities in the specified municipality.	Composting	This register provides solid overview of the key data input required for futher analysis in the scope of agriculture and forestry sector in municipality of Strumica
8	2017	Construction Institute "Macedonia" a.d. – skopje	**Report on strategic environmental assessment of the environment in the regional waste management plan for the southeastern planning region**	https://southeast.mk/wp-content/uploads/2021/10/СОЖС-за-управување-со-отпад-ЈИ-регион.pdf	-	Center for development of the southeast planning region	The report on the Strategic Environmental Assessment (SEA) for the Southeastern Planning Region's Waste Management Plan provides a detailed overview. It covers SEA principles, the content of the planning document, and an action plan. The characteristics of the region, including geography, climate, and socio-economics, are examined. The current environmental state is outlined, emphasizing air quality, water conditions, and waste management. The report defines main planning objectives, considers potential environmental impacts, proposes mitigation measures, explores alternatives, and introduces a monitoring plan.	Composting	This document provides overview of the current waste management and plans how to improve the waste management, including the biodegradable waste, and therefore it links with the project and its bio-based value chain, the composting and agricultural residues.

9	2017	NGO Planetum, Alliance One	**Impact of some agricultural activities on the environment and biodiversity in the Strumica region.**	https://www.planetum.mk/images/b8.pdf	-	NGO Planetum, Alliance One	This document covers various aspects related to biodiversity and environmental challenges in the Strumica region. It starts by defining biodiversity and highlighting its significance in the region. The focus then shifts to water pollution, irrigation water quality, and the impact of pesticide use on groundwater and biodiversity. The document also explores the environmental consequences of stubble burning, both generally and specifically in the Strumica region. It touches upon the production of staple crops like real grains and concludes by examining the climate characteristics of the Strumica basin. Overall, it provides a concise overview of the environmental landscape and biodiversity considerations in the Strumica region.	Composting	The topics of water pollution, pesticide use, and stubble burning are relevant to composting as they can directly impact the quality of compost. Contaminated water sources and pollutants from pesticides or burning practices may introduce harmful substances into the compost, affecting its suitability for agricultural use. Understanding and addressing these environmental factors is crucial to ensure that compost remains a safe and effective soil amendment.
10	2020	Center for development of the southeast planning region	**Biodiversity Strategy and Action Plan for the Southeastern Planning Region**	https://southeast.mk/wp-content/uploads/2021/07/Стратегија-за-биолошка-разновидност-и-Акционен-План-за-Југоисточен-плански-регион-финално.pdf	-	Center for development of the southeast planning region	The document introduces a comprehensive strategy for biodiversity conservation in the Southwestern Planning Region. It covers global and national strategic perspectives, assesses geographical characteristics, identifies biodiversity threats, and presents an extensive action plan. The plan includes measures for monitoring, education, and public awareness, emphasizing the importance of both formal and informal education in achieving conservation goals.	Composting	The document on biodiversity in the Southwestern Planning Region may not have direct relevance to composting, as its primary focus is on biodiversity conservation strategies. However, composting can indirectly benefit from such initiatives by promoting healthier ecosystems and soil conditions, which, in turn, can positively impact composting processes and contribute to sustainable waste management practices. Biodiversity conservation efforts often emphasize sustainable land use and environmental practices, aligning with broader goals of responsible resource management, which can include composting practices.
11	2016	PointPro Consulting - Skopje	**Area of the strumica river basin river basin management plan 2016 – 2027**	https://www.moepp.gov.mk/wp-content/uploads/2015/01/RBMP-Strumica-2016-2027_MK.pdf	-		This document outlines strategies and actions for the sustainable management of the Strumica River Basin over the specified timeframe. It likely includes assessments of the basin's water resources, potential threats such as pollution or overuse, and proposed measures to protect and enhance water quality and quantity. The plan aims to address environmental concerns, promote efficient water usage, and ensure the long-term health and resilience of the river basin ecosystem.	Composting	The "Area of the Strumica River Basin River Basin Management Plan 2016 – 2027" outlines strategies for sustainable management of water resources, environmental protection, flood prevention, water quality improvement, and fostering sustainable development within the Strumica River Basin over the specified timeframe.
12	2015	Stojan Georgiev, Sonja Stojkova, Gjorgi Dimitrievski	**Operational plan for protection and defense against flooding for the endangered areas of the territory under the jurisdiction of the "municipality of strumica" for the year 2015**	/		Municipality of Strumica	The operational plan outlines strategies for protecting and defending against flooding in vulnerable areas within the jurisdiction of the Municipality of Strumica. It identifies key endangered areas and proposes measures to mitigate the risk of flooding, safeguarding both infrastructure and communities. The plan likely includes provisions for early warning systems, infrastructure improvements, emergency response protocols, and community engagement initiatives. By implementing this plan, the Municipality aims to enhance resilience to flooding events and ensure the safety and security of its residents and resources.	Composting	The operational plan in the Municipality of Strumica focuses on safeguarding against flooding, indirectly benefiting composting by supporting agricultural resilience and protecting composting infrastructure from potential damage. The plan's emphasis on effective resource management, including water resources, aligns with responsible composting practices. By implementing flood protection measures, the Municipality aims to ensure the continuity of composting activities and enhance overall agricultural resilience in vulnerable areas.

5. Biomass availability studies and nutrient recycling

Please add biomass availability and nutrient recycling studies that you find of interest to the deployment of your bio-based solutions.

List of relevant studies

Solution 1: Composting

Solution 2: Agricultural residues and mycelium-based inslulation and packaging solutions

	Year	Author(s)	Title	Link	Translation link (English -> Macedonian)	Summary of contents	Relevant to which solution?	Why is it relevant?
1	2021	D. Hidalgo, F. Corona & J. M. Martín-Marroquín	Nutrient recycling: from waste to crop	https://link.springer.com/article/10.1007/s13399-019-00590-3	https://link-springer-com.translate.goog/article/10.1007/s13399-019-00590-3?error=cookies_not_supported&code=d7dd7400-0367-4dd0-8db5-19c089454d97&_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=en-US&_x_tr_pto=wapp	Within the transition to a bio-based economy from a fossil reserve-based world, we face the vital dare of closing nutrient cycles and moving to a more practical and balanced resource management, taking into account not only the economical but also the environmental perspective. The manufacture and transportation of mineral fertilizers are activities that require large amounts of fossil energy. Therefore, the dependence that agriculture has on fertilizers based on mineral reserves (mainly P, N, and K) should be considered as a very serious threat to human food security and climate change. On the other hand, the existing forecast on phosphorus reserves is pessimistic. According to the latest published figures on population growth and estimated demand for nutrients in the future, depletion of this material is expected to occur within a maximum of 300 years. At the same time, the agricultural demand that exists for mineral fertilizers is constantly growing. The main reason is the increase in the world population, together with the increase in meat consumption and the popularity of energy crops. Despite these negative perspectives, the processing or elimination of waste streams causes uncontrolled dispersion in the environment of a large amount of minerals. Thus, a new global effort is needed to draw a new scenario where improved nutrient use efficiency and, at the same time, reduced nutrient losses provide the bases for a more circular economy, to produce more necessary inputs, as food or energy, as the same time as decreasing environmental impact.	Composting	This paper will show the process options which can "upcycle" and recover residual nutrients to high-quality end-products, defined by efficient nutrient use and will reveal the key issues to face with novel biofertilizer products and changing policies.
2	2017	EIP-AGRI Focus Group	Nutrient Recycling	https://ec.europa.eu/eip/agriculture/sites/default/files/eip-agri_fg_nutrients_recycling_final_report_2017_en.pdf	-	The dependency of agriculture on fossil-based mineral fertilisers (especially N, P, and Potassium: K) must be regarded as a very serious threat to future food security. Furthermore, estimates of remaining phosphorus reserves are highly uncertain. Based on population growth and future demand for nutrients, the scarcity of phosphorus at a global level and the absence of geological reserves on the European continent mean that this a future threat requires much attention. For these reasons, the EC has placed phosphate rock on the list of Critical Raw Materials (CRMs). These CRMs are materials with a high economic importance to the EU which also have a high risk associated with their supply. European agriculture therefore needs to progress towards more closed loops concerning the provision of nutrients. This can be envisaged both within the agricultural sector and the mineral fertiliser industry where recycled nutrients can be used as input. It must not be forgotten that nutrient recycling can allow farmers to be less dependent on imported and purchased fertilisers - and so less exposed to price variations or supply issues. Nutrient recycling can also create rural jobs in processing, marketing and distribution of recycled nutrient products.	Composting	This document is cricial as it describes the importance of the nutrient recycling, but also provides a technology review, market need aspects and legal framework. Furthermore, it identifies the research gap and provides good practises that can be replicated in Strumica region.
3	2014	Francesco G. Ceglie and Hamada M. Abdelrahman	Ecological Intensification through Nutrients Recycling and Composting in Organic Farming	https://link.springer.com/chapter/10.1007/978-3-319-08004-8_1	https://link-springer-com.translate.goog/chapter/10.1007/978-3-319-08004-8_1?error=cookies_not_supported&code=28a41000-71a7-40f4-a137-fc4454deb2b1&_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=en-US&_x_tr_pto=wapp	In organic agriculture fertilizers are permitted in organic forms, as defined by regulation. Mineralization of organic fertilizers is a biological decomposition that release plants' available nutrients; hence soil microbial communities are vital in the organic cropping systems. Composting microorganisms can work for the farmer's benefit recycling agricultural organic wastes into materials that contribute to healthy and biologically active soil. Composting process has been deeply described to highlight the link among starting mixture, process factors and final resulting compost. Composting and crop residues incorporation are fundamental to recycle resources at farm level to improve the nutrients use efficiency and to decrease the off-farm input needs. In the organic farming a balanced combination of compost application and crop residues incorporation increases the microbial carbon use efficiency, which regulates the soil organic matter decomposition and nutrients mineralization resulting both to increase the yield and to decrease the negative impact on the environment.	Composting	This document is suitable for obtaining more details on crop residues recycling, nutrients use efficiency and C/N ratio.

4	2021	Centre for development of the South-East region	Programme for development of the South-East Planning Region 2021-2026	https://southeast.mk/wp-content/uploads/2021/04/Програма-за-развој-на-Југоисточниот-плански-регион-2021-2026.pdf	https://link-springer-com.translate.goog/chapter/10.1007/978-3-319-08004-8_1?error=cookies_not_supported&code=057e70c1-22f2-41be-988e-f325919f8b63&_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=en-US&_x_tr_pto=wapp	Programme for development of the South-East Planning Region 2021-2026 is a mid-term planning document which defines the regional development goals (for investments, modern and quality education, health and social sectors, preserved and improved environment, agriculture and rural development facilities), as well as the priorities and measures which will contribute to the achievement of the mid-term goals.	Composting	This programme is mid-term planning document which defines the regional development goals in several rural aspects. It depict the status-quo of the agricultural sector and possibilities how to utilize the residues.Furthermore, it outlines the quantities of biodegradable waste and the urge for an institutionalized approach of management to such residues.
5	\	State Statistical Office	Database for agriculre production	https://makstat.stat.gov.mk/PXWeb/pxweb/en/MakStat/MakStat_Zemjodelstvo/	https://makstat-stat-gov-mk.translate.goog/PXWeb/pxweb/en/MakStat/MakStat__Zemjodelstvo/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=en-US&_x_tr_pto=wapp	The State Statistical Office database for agriculture and forestry provides critical data on various key aspects, including agricultural area categorized by use in hectares, as well as detailed information on the area and production of grain, forage crops, and vegetables. Additionally, the database includes valuable insights into yields for these crops. Furthermore, it offers essential figures such as the number of fruit and fruit-bearing trees, along with production statistics for fruit. Lastly, the database covers forest area by type, offering a comprehensive overview of the agricultural and forestry landscape.	Composting	This database provides all neccesary key data input required for futher analysis in the scope of agriculture and forestry sector in municipality of Strumica
6	2022	Prof. dr. Ljupcho Mihajlov - Agricultural faculty at the State University "Goce Delchev" in Shtip	Analysis of the current situation with the agricultural residues in Bregalnicki region	https://eastregion.mk/wp-content/uploads/2022/02/Анализа%20за%20состојба%20со%20пожетвени%20остатоци%20во%20Брегалнички%20регион.pdf	-	The study focuses on the biomass of post-harvest residues in the Bregalnica region, examining types and quantities of cultivated cereals, grain production, and previous experiences with post-harvest biomass treatment. It highlights the harmful consequences of burning these residues and explores legal regulations related to agro-environmental measures. The paper suggests alternatives for handling post-harvest residues, including using them as renewable energy sources, organic fertilizers, and in compost production. Specific applications, such as rice straw compost for mushroom production and using rice straw for animal feed, are discussed. The study concludes with recommendations for good agricultural practices in managing post-harvest residues in the Bregalnica region.	Composting	Althought this study is not for originally conduted for the target region, it provides a set of good practices for utilization of agricultural residues that could be replicated in the Strumica region along with several recommendations applicable for cosiderated area.
7	2016	Prof. Dr. Dushko Mukaetov	Project for the Restoration of the Strumica River Basin - Soils	https://southeast.mk/wp-content/uploads/2020/12/Integralna-zastita-brendiran-v2.pdf	-	This document covers the fundamental aspects of soils, starting with an introduction. It delves into the water-physical and chemical properties of soil, including the presence of calcium carbonate. Additionally, it explores fertilizers and fertilization, encompassing organic fertilizers such as manure, green fertilization methods like cover cropping, composting, and vermiculture, as well as mineral fertilizers.	Composting	This documents provide a great summary of the type of soils and different fertilizers how they can be utilized in the Strumica region.
8	2018	GIZ GmbH and Rural Development through Integrated Forest and Water Management	Management of Natural Resources in SEE: Forests, Soils, and Waters	https://seerural.org/wp-content/uploads/2018/02/NRM-Report-Macedonian.pdf	-	This document comprises two parts focusing on regional aspects relevant to forest, soil, and water resources in Southeastern Europe (SEE) and an overview of natural resource management in Macedonia. The regional analysis assesses key issues, status, and EU policies for forest, water, and soil resources in SEE, offering recommendations for integrated management. The section on Macedonia provides insights into the country's forestry, water, and land management, along with project overviews, trend evaluations, and recommendations for improved national resource management.	Composting	The relevance of this document for composting lies in its comprehensive analysis of regional aspects related to soil resources in NM. The insights provided into soil management practices, along with evaluations of trends and recommendations for integrated natural resource management.
9	2016	Biljana Kovacevic	Investigation of groundwater quality in the strumica region as an important agricultural resource production	https://eprints.ugd.edu.mk/17006/	https://eprints-ugd-edu-mk.translate.goog/17006/?_x_tr_sl=en&_x_tr_tl=mk&_x_tr_hl=en-US&_x_tr_pto=wapp	The investigation delves into assessing the quality of groundwater in the Strumica region, emphasizing its significance as a crucial resource for agricultural production. Through this study, researchers aim to understand the current state of groundwater quality in the area and its implications for agricultural activities. By examining various parameters and contaminants present in the groundwater, the study seeks to provide valuable insights for sustainable agricultural practices and resource management in the region.	Composting	The investigation into groundwater quality in the Strumica region is crucial for composting as it informs the nutrient content and potential contaminants in the water used for the process. The study's focus on sustainable agriculture aligns with composting objectives, ensuring that composting practices contribute positively to soil health. Knowledge of groundwater quality enables informed decisions on resource management, particularly in the sustainable use of water for composting in the region.

SCALE UP
community-driven
bioeconomy development

SCALE-UP Information Package

T2.4 Review and preparation of existing scientific and technological information supporting bio-based solutions

Region:	Upper Austria
Organization:	TMG
Biomass stream/value chains:	Food waste
Bio-based solutions:	Spent brewery grains, bakery waste products

This information package aims at reviewing and collecting information relevant to the SCALE-UP project and for the regional platforms. Relevant studies should aim at supporting the bio-economy rollout in the SCALE-UP regions and of the specific bio-based solutions.

Information on the following topics will be gathered:

1. EU Policies and legislation
2. Research projects
3. Local policies
4. Technical Information on specific biobased solutions
5. Biomass availability & Nutrient recycling

1. EU Policies & Legislation

EU policies and legislation relevant to the SCALE-UP project and bio-based solution.

Other sources of interest: JRC Knowledge Centre for Bioeconomy (English) JRC Knowledge Centre for Bioeconomy (German)

List of important EU policies and legislation

	Date	Name	Link	Translation link (English → German)	Summary of contents	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	02-2012	**EU bioeconomy strategy**	https://op.europa.eu/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478	https://op-europa-eu.translate.goog/en/publication-detail/-/publication/edace3e3-e189-11e8-b690-01aa75ed71a1/language-en/format-PDF/source-149755478?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	The 2012 European Bioeconomy Strategy paved the way for a more innovative, resource-efficient and competitive society that reconciles food security with the sustainable use of renewable resources for industrial purposes, while ensuring environmental protection. A comprehensive review concluded that it has been a success, notably at mobilising research and innovation, boosting private investments, developing new value chains, promoting the uptake of national bioeconomy strategies and involving stakeholders.	The EU bioeconomy strategy aims at strenghtening and scaling-up bio-based sectors, as well as deploying local bioeconomies across Europe. Through: -The deployment of the bioeconomy will lead to the creation of jobs, especially in rural areas through the growing participation of primary producers in local bioeconomies. -The bioeconomy strategy sets as one of its main goals to support research and innovation and deployment of innovative solutions for the production of new and sustainable bio-based products. -A Strategic Deployment Agenda will be developed, which will provide a long-term vision on pathways to deploy and scale up the bioeconomy in a sustainable and circular manner. -Enhance synergies between existing EU instruments to support local activities. -CAP to support bioeconomies in rural areas.	Relevant to the specific bio-based solutions: -It aims at increasing the availability of secondary materials (such as feed and biowaste) for further exploitation through conventional technologies (e.g. composting and anaerobic digestion) and innovative ways of extracting valuable substances. Innovation is expected to support markets for bio-based products, where one industry's waste becomes the starting material for another. -It addresses new opportunities for the forestry sector, where non-sustainable raw materials in various sectors are replaced with forestry-based materials and chemicals. -Biowaste and residues can be used as valuable resources and can help reduce food waste by 50% by 2030.
2	2019	**European Green Deal**	https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/european-green-deal_en?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	European Green Deal is a set of comprehensive and integrated to transform the EU into a modern, resource-efficient and competitive economy, ensuring no net emissions of green house gases by 2050 and economic growth decoupled from reseource use.	The Green Deal includes measures in agriculture on the reduction of environmental and climate foodprint and increase of competative sustainablility from farm to fork (see below). In the energy sector the Green Deal includes measures to promote eco design of products en renewable energy from sustainable biomass resources.	
3		**European Digital Strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age_en?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wa	The EU's digital strategy aims to make this transformation work for people and businesses, while helping to achieve its target of a climate-neutral Europe by 2050.	EU's digital strategy recognises that digital technologies are profoundly changing our world, and generate an ever-increasing amount of data, which if pooled and used properly, can lead to completely new means and levels of value creation, leading towards more sustainable solutions which are resource-efficient, circular and climate-neutral.	Real time tracking, new, added-value creations, interconnections, boosting bio-based solutions driven by new, high and/or deep technologies
4	02-2020	**European data strategy**	https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en	https://commission-europa-eu.translate.goog/strategy-and-policy/priorities-2019-2024/europe-fit-digital-age/european-data-strategy_en?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	The European data strategy aims to make the EU a leader in a data-driven society. Creating a single market for data will allow it to flow freely within the EU and across sectors for the benefit of businesses, researchers and public administrations.	The EU is creating a single market for data where data can flow within the EU and across sectors, for the benefit of all European rules, in particular privacy and data protection, as well as competition law, are fully respected the rules for access and use of data are fair, practical and clear	By having more information, consumers and users such as farmers, airlines or construction companies will be in a position to take better decisions such as buying higher quality or more sustainable products and services, thereby contributing for example to the Green Deal objectives.

5	01-2023	**Common Agricultural Policy (CAP) CAP 2023-27**	https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-glance_en#cap2023-27	https://agriculture-ec-europa-eu.translate.goog/common-agricultural-policy/cap-overview/cap-glance_en?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=en-US&_x_tr_pto=wapp#cap2023-27	The CAP 2023-2027 must be oriented more than ever to respond to the specific needs of the agricultural sector and rural areas in terms of equity, distribution of support, instruments and characteristics, after the serious health crisis caused by COVID. To achieve these objectives, the CAP is focusing on innovation, CAP Strategic Plans (in line with the objectives and targets of the "Green Deal"), giving the EU a greener and fairer CAP.	The CAP 2023-2027 includes "support for rural development" as one of its focal points through the development of a wide range of tools including: Funding for investment, knowledge creation, innovation and cooperation will in many cases be targeted at environmental and climate-related needs, but will also serve other CAP objectives.	Within the CAP 2023-2027, it is indicated that the improvement of existing requirements is also a necessary condition for the improvement of agricultural sustainability, for this purpose, measures are proposed to improve soil health in the long term, so farmers are required to carry out beneficial crop rotations (among other measures). On the other hand, a wide range of types of action are proposed, including ecosystems that support voluntary actions related to better nutrient management, agroecology, agroforestry, carbon farming or animal welfare (among others).
6	05-2020	**Farm to Fork strategy**	https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en	https://food-ec-europa-eu.translate.goog/horizontal-topics/farm-fork-strategy_en?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=en-US&_x_tr_pto=wapp	The Farm to Fork Strategy is a set of measures to accelerate the transition to a sustainable food system that should have a neutral or positive environmental impact help to mitigate climate change and adapt to its impacts, reverse the loss of biodiversity ensure food security, nutrition and public health, making sure that everyone has access to sufficient, safe, nutritious, sustainable food preserve affordability of food while generating fairer economic returns, fostering competitiveness of the EU supply sector and promoting fair trade.	The Farm to Fork Strategy includes measures to promote sustainable food production and processing (including nutrient recycling). This includes measures on the compatativeness of the EU food supply sector including use of residues for bioproducts	

2. Research Projects

Please add Interreg, Horizon 2020, Horizon Europe projects, and other projects that you find relevant to the SCALE-UP project and for your bio-based solutions.

Other sources of interest:	JRC Knowledge Centre for Bioeconomy (English)	JRC Knowledge Centre for Bioeconomy (German)

List of relevant projects

	Start month	End month	Name	Project website	Translation link (English to German)	Project summary	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions	Activities of interest	Comments
1	1-9-2022	1-8-2025	**MainstreamBIO**	https://mainstreambio-project.eu/	https://mainstreambio--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	MainstreamBIO sets out to get small-scale bio-based solutions into mainstream practice across rural Europe, providing a broader range of rural actors with the opportunity to engage in and speed up the development of the bioeconomy. Regional Multi-actor Innovation Platforms (MIPs) will be established in 7 EU countries (PL, DK, SE, BG, ES, IE and NL) to enhance cooperation among key rural players towards co-creating sustainable business model pathways in line with regional potentials and policy initiatives.	Innovation support services,Decision Support System, Multi-actor Innovation Platforms, Digitalisation and Practice abstracts.	Some cases related with our 12 bio-based solutions (potential exchange of good practices and Knowledge)	WP4, WP5	SCALE-UP sister project
2	1-10-2022	1-9-2025	**RuralBioUp**	https://www.ruralbioup.eu/	https://www-ruralbioup-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	RuralBioUp will strengthen the cooperation among regional key actors and knowledge holders, empowering them to establish an inclusive and long-lasting ecosystem (the RuralBioUp Regional Hubs) to support the mainstreaming of bio-based business models in rural areas. In particular, RuralBioUp will establish 9 Regional Hubs in 6 EU countries, that will co-design and implement 9 Action Plans on 18 value chains.	9 regional hubs (one multi-stakeholder hub) are established in 6 EU countries (France, Romania, Czech Republic, Ireland, Latvia and Italy). 9 Action Plans will be implemented in 18 value chains.	Biomass value chain development: Biomass logistic, Valorisation, Communities. Lessons learnt	WP4, WP5	SCALE-UP sister project
3	1-9-2022	1-8-2025	**BioRural**	https://biorural.eu/	https://biorural-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	BioRural's goal is to create a European Rural Bioeconomy Network to promote small-scale bio-based solutions in rural areas and support the transition towards a sustainable, regenerative, inclusive and just circular Bioeconomy across all Europe at local and regional scale.	BioRural focusses on EU-level developments, it does not feature any regional case studies.	Rural Bioeconomy Alliance. Network. Cooperate to promote the currently available small-scale bio-based solutions		SCALE-UP sister project
4	1-4-2019	1-7-2022	**BE-Rural**	https://be-rural.eu/	https://1-be--rural-eu.translate.goog/?_x_tr_enc=1&_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	BE-Rural aimed at exploring the potential of regional and local bio-based economies and support the development of bioeconomy strategies, roadmaps and business models. To this end, the project focused on establishing Open Innovation Platforms (OIPs) within selected regions in five countries: Bulgaria, Latvia, North Macedonia, Poland and Romania.		Case study in North Macedonia (focussing on Mycelium-based packaging and insulation material); Case study in Latvia (foussing on wood wool)	D5.1 "Briefing paper: Analysing market conditions and designing business models within BE-Rural's OIPs"; D5.2 "Summary report on small-scale bio-based business models and their market potentials"; D5.4 "Note on the development of a sustainability screening for regional bioeconomy strategies"	Power4Bio sister project
5	1-10-2018	1-3-2021	**POWER4BIO**	https://power4bio.eu/	https://power4bio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	POWER4BIO project aimed at empowering regional stakeholders to boost the transition towards bioeconomy regions in Europe by providing them with the necessary tools, instruments and guidance to develop and implement sound sustainable bioeconomy strategies. POWER4BIO targeted 10 regions with a focus on regions in Central and Eastern Europe.		Case study in Andalusia (focussing on Bioeconomy Strategy and Available Biomass Sources At Regional Level (Olive Biomass, Intensive Horticulture and Seaweed production)) and Mazovia (agricultural residues)	D3.3 "Catalogue with bio-based solutions"; D6.4 "Training design and materials for increasing the bioeconomy capacity of regional stakeholders"	BE-Rural sister project; certain outputs related to the development of bio-based solutions were classified as confidential and are thus not publicly available.

Other projects

	Start month	End month	Name	Project website	Translation link (English to German)	Project summary	Relevance to SCALE-UP	Comments
1	09-2022	08-2025	**ShapingBio**	https://www.shapingbio.eu/	https://www-shapingbio-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	The overall aim of ShapingBio is to support and accelerate bioeconomy innovation and the deployment of new knowledge in the EU and its member states. ShapingBio aims to provide evidence-based and concrete information and recommendations for better policy alignment and stakeholder actions to realize the cross-sectoral potential of the bioeconomy and to reduce the fragmentation across bio-based sectors and food system and policies across regions, domains and governance levels.	Promote innovation in the EU bioeconomy.	ShapingBio focusses on EU macro-regions, it does not feature any rural case studies.
2	07-2022	06-2025	**BioModel4Regions**	https://www.biomodel4regions.eu/	https://www-biomodel4regions-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	BIOMODEL4REGIONS aims to support the establishment of the innovative governance models at local/regional level to achieve better-informed decision-making processes, social engagement and innovation to support and strengthen EU and international science-policy interfaces to achieve the Sustainable Development Goals.	Support regional bioeconomies.	
3	09-2022	08-2025	**CEE2ACT**	https://www.cee2act.eu/	https://www-cee2act-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	CEE2ACT will empower countries in Central Eastern Europe and beyond to develop circular bioeconomy strategies and action plans through knowledge transfer and innovative governance models enabling sustainability and resilience to achieve better informed decision-making processes, societal engagement and innovation, building on the practice of experienced countries serving as role models.	Development of bioeconomy strategies.	CEE2ACT focusses on national-level developments, it does not feature any regional/rural case studies.
4	09-2022	08-2025	**ROBIN**	https://robin-project.eu/	https://robin--project-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	ROBIN aims to empower Europe's regions to adapt their governance models and structures in ways that accelerate the achievement of their circular bioeconomy targets while promoting social innovation and accounting for different territorial contexts. In this context, ROBIN will support 5 regional authorities across Europe (Southern Region of Ireland, Central Macedonia, Andalusia, Baden-Wuerttemberg, Zilina) to adapt their governance models to support the scaling up of the bio-based value chains of their ecosystem.	Regional bioeconomy development, as well as social innovation in the bioeconomy, which is covered in WP5 of SCALE-UP.	
5	06-2022	05-2025	**RELIEF**	https://relief.uop.gr/	https://relief-uop-gr.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	RELIEF aims to develop and deliver an innovative approach for teaching bio-economy in farming, by developing specific learning resources addressing HEIs students and farming practitioners. RELIEF will deliver a training needs analysis and develop two curricula in bio-economy, for HE students, farming practitioners and farmers exploring the key areas that are critical for the implementation of business models and strategies towards bio-economy in farming.	Training courses on bioeconomy, also covered in WP3 of SCALE-UP.	
6	01-2021	06-2023	**COOPID**	https://coopid.eu/	https://coopid-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	Wtin COOPID, a network of bioeconomy clusters from 10 European countries has been created, involving a range of stakeholders: primary producers, in cooperatives or associations, within agriculture, forestry and aquaculture; industry; public sector; research and academia. So-called COOPID ambassadors showcased success stories, organised workshops and conducted interactive dissemination and communication campaigns. The focus was on the uptake of sustainable bio-based business models in the primary production sector.	Development of bioeconomy clusters.	D4.2 "Success story factors for biobased Business models"
7	12-2022	11-2026	**P2GreeN**	https://p2green.eu/	https://p2green-eu.translate.goog/?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	P2GreeN will implement and demonstrate innovative N & P recovery solutions based on human sanitary waste from urban settlements and its conversion into safe bio-based fertilisers for agricultural production. The project will test the solutions in three pilot regions on a north-south trajectory.	Nutrient recovery is a part of SCALE-UP.	

3. Regional, National & Local policies

Please add the local policies (including strategies, roadmaps, incentives, subsidy schemes and regulatory information) that you find relevant to the SCALE-UP project and to your bio-based solutions.

List of relevant policies

	Year	Regional/Provincial/National	Title	Link	Translation link	Author/Publisher:	Policies	Relevance to the SCALE-UP project	Relevance to the specific bio-based solutions
1	2019	National	**Bioeconomy Strategy for Austria**	https://www.bmk.gv.at/en/topics/climate-environment/climate-protection/bioeconomy/strategy.html	https://www-bmk-gv-at.translate.goog/en/topics/climate-environment/climate-protection/bioeconomy/strategy.html?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=en-US&_x_tr_pto=wapp	Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology	The long-term goal of the bioeconomy is to reduce fossil material and energy consumption and at the same time substitute it with renewable raw materials. The basis for action here is formed by European and international objectives and commitments such as the Paris Climate Agreement or the United Nations Sustainable Development Goals (SDGs) made binding in the 2030 Agenda. In the Austrian strategy, these goals were placed in front in the form of guidelines, which thus form the framework for the further design of future bioeconomy measures.	The strategy sets concrete measures for the bioeconomy rollout in Austria..... (Please try to be specific)	The strategy aims at promoting innovative bio-economy related concepts, services and goods. This is done through increased patents and scientific publications that can be relevant as they.... (Please try to be specific)
2	2023	Regional	**UpperVision#2030**	uppervision.at	https://www.uppervision.at/	: Business Upper Austria – OÖ Wirtschaftsagentur GmbH und Amt der Oö. Landesregierung	In order to secure Upper Austria as a business, industrial and research location and to maintain its international competitiveness, it must be our aim to drive forward the development of products, services and technologies and to generate more start-up research, technology-oriented and exporting companies in Upper Austria. We are relying on Smart Specialization and the rapid transfer of research results to economic to bring Upper Austria to the forefront of technological developments.	#upperVISION2030 tracks not only economic but also socio-political trends with a view to sustainability goals and thus creates synergies with the UN Agenda 2030	One goal in this vision is to develop technological processes that increase flexibility with regard to the use of raw materials, enable the cascading or combined use of raw and residual materials, and thus generate additional value added. and thus generate additional value added.
3	2012	National	**Rückstände aus der Nahrungs- und Genussmittelproduktion**	untitled (umweltbundesamt.at)	-	Umweltbundesamt - Environment Agency Austria	The annual generation of residues from plant based food and feed production industries is estimated to be 1.26 million tonnes in Austria. This is about 10 times the amount of waste from plant based food and feed production reported to be treated. The main reason for the difference is that by far the biggest majority of these residues is used as feed and thus classified as by-product. On the whole the Austrian food and feed industry in cooperation with the Austrian waste management sector follows the waste hierarchy as specified by the waste framework directive (2008/98/EC): 1. Waste is prevented by optimising the production processes; 2. If possible residues from food and feed industry are used as food and feed in secondary applications; 3. Residues which cannot be used as food or feed are composted, 4. or used as input for biogas generation. (Thermal treatment plays only a small part, but if applied, the energy is recovered.) 5. There is no depositing of food and feed waste in Austria as these are reac tive, biodegradable waste types.	Bakery production waste products	The report contains information on valorization options of food waste (including bakery products) and which valorization option of food waste would be considered as up-scaling or downscaling
4	2018	local, based on EU	**Guidelines for the use of food that is no longer intended for human consumption as animal feed**	https://eur-lex.europa.eu/legal-content/DE/TXT/PDF/?uri=CELEX:52018XC0416(01)&from=EN	-		As an integral part of the Communication on a Circular Economy (1), the Commission has developed an Action Plan to reduce food waste. One of the initiatives is about, recovering the nutrients in foods that are no longer fit for human consumption for economic reasons, or because of problems in production or because of certain deficiencies, by using them safely in animal feed.	food waste used as feed	the report contains information on usage of food/food waste as feed.

4. Technical information on specific bio-based solutions

Please add technical information, including scientific information, peer-reviewed articles, reports, and other data or research that you find relevant to the bio-based solutions.

List of relevant technical information

Solution 1: Spent brewery grains

Solution 2: Bakery production waste products

Solution 3:

	Date	Author(s)	Title	Link	Translation link (English -> German)	Organizations	Summary of contents	Relevant to which solution?	Why is it relevant?	Comments
1	2005	Winfried Russ. Heinrich Mörtel. Roland Meyer-Pittroff	**Application of spent grains to increase porosity in bricks**	Application of spent grains to increase porosity in bricks - ScienceDirect	https://www-sciencedirect-com.translate.goog/science/article/abs/pii/S0950061804001187?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp		The dumping of spent grains is going to be more difficult because of the increasing number of cattle. That means new ways of dumping must be developed. The goal of the work was to test the technical properties of bricks produced with spent grains added to increase porosity. The flexural strength of the fired samples remained at 8.5 MPa; the air-dried samples exhibited a small increase in flexural strength. The shrinkage and true density were almost identical, while the raw density, capacity for water absorption and open porosity showed minor differences. In the large-scale experiment no problems were observed during the production. The bricks produced with spent grains possessed a comparable or higher strength, a higher porosity and a reduced density after firing than those from a standard production clay. Because of the lower sintering temperatures the fired clay product was more strongly sintered, exhibiting both greater strength and higher porosity.	Spent brewery grains	The study describes a way how to valorize spent grains from brewery in a cross-sectoral application.	
2	2022	Zeinab Qazanfarzadeh. Abirami Ramu Ganesan. Loredana Mariniello. Lorenza Conterno. Lorenza Conterno	**Valorization of brewer's spent grain for sustainable food packaging**	Valorization of brewer's spent grain for sustainable food packaging - ScienceDirect	https://www-sciencedirect-com.translate.goog/science/article/abs/pii/S0959652622053008?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp		The accumulation of petroleum-based plastics causes economic and environmental concerns which necessitate a comprehensive search for biodegradable packaging materials. Brewer's spent grain (BSG) is an interesting by-product, which is one of the main wastes of beer production in Europe. BSG could offer added value in the food packaging sector owing to the significant amount generated annually, high biomaterials content, and low market value. Herein, the significance of various biorefinery techniques (physical, chemical, and biological) for the extraction of high-value products (such as protein, cellulose, hemicellulose, lignin, and phenolic compounds) from the BSG are comprehensively examined. BSG-derived biodegradable films and coatings for food packaging are critically evaluated. Finally, techno-economics, environmental impacts, energy consumption, regulations, challenges, and prospects are also critically evaluated. The best biorefinery system necessitates a balance between extraction efficiency, energy consumption, environmental impact, tangible upscaling, and operating cost. The mechanical dewatering of BSG before extraction, including the physical pretreatments, utilization of green solvents, the integration of the solvent recovery system, and the combination of two or more biorefinery techniques could reduce the energy requirements, greenhouse gas emissions, and increase the recovery yield of biomaterials. Cellulose, lignin, xylitol, and arabinoxylan are recommended as the most promising components from BSG for food packaging	Spent brewery grains	This review describes different ways how spent brewery grains could potentially be used as a film and coating material for food packaging as well as ways on how to improve the environmental impact of BSG.	
3	2022	Anđela Zeko-Pivač. Marina Tišma. Polona Žnidaršič-Plazl. Biljana Kulisic. George Sakellaris. Jian Hao. Mirela Planinić.	**The Potential of Brewer's Spent Grain in the Circular Bioeconomy: State of the Art and Future Perspectives**	Frontiers | The Potential of Brewer's Spent Grain in the Circular Bioeconomy: State of the Art and Future Perspectives (frontiersin.org)	https://www-frontiersin-org.translate.goog/articles/10.3389/fbioe.2022.870744/full?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	Josip Juraj Strossmayer University of Osijek	Brewer's spent grain (BSG) accounts for approximately 85% of the total mass of solid by-products in the brewing industry and represents an important secondary raw material of future biorefineries. Currently, the main application of BSG is limited to the feed and food industry. There is a strong need to develop sustainable pretreatment and fractionation processes to obtain BSG hydrolysates that enable efficient biotransformation into biofuels, biomaterials, or biochemicals. This paper aims to provide a comprehensive insight into the availability of BSG, chemical properties, and current and potential applications juxtaposed with the existing and emerging markets of the pyramid of bio-based products in the context of sustainable and circular bioeconomy. An economic evaluation of BSG for the production of highly valuable products is presented in the context of sustainable and circular bioeconomy targeting the market of Central and Eastern European countries (BIOEAST region).	Spent brewery grains	This review describes the state of the art of how brewer's spent grain (BSG) is used in circular bioeconomy at the moment at what potential uses in the future could be.	

4	2021	Samuel Vinícius Bonato. Diego Pacheco. Carla Schwengber ten Caten. Dario Caro.	**Circularity in small breweries' value chains: Unveiling strategies for waste management and biomass valorization**	(PDF) Circularity in small breweries' value chains: Unveiling strategies for waste management and biomass valorization (researchgate.net)	https://www-researchgate-net.translate.goog/publication/357446700_Circularity_in_small_breweries'_value_chains_Unveiling_strategies_for_waste_management_and_biomass_valorization?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp&_x_tr_hist=true	Universidade Federal do Rio Grande (FURG)	Despite the large quantities and possibilities of reuse of the by-products (solids and liquids) generated by the brewing industry, the proper disposal of these by-products has imposed severe problems for circular and cleaner production transitions worldwide. These challenges are still more salient for the small breweries due to the recognized lack of resources, such as knowledge, finances, and skilled staff. To address this problem, this article aims to identify sustainable strategies for waste management and biomass valorization that can be implemented in the value chain of small breweries. A mixed-method approach was implemented for the data collection and analysis to expand the evidence of the findings, including interviews with 18 small breweries and six specialists in the sector. We found that breweries mainly dispose of the by-products for animal feeding, although industry experts and the specialized literature indicate that at least 21 reuse and recycling alternatives have not been implemented in the value chain. Findings add to the literature five new alternatives informed by companies and six informed by experts for circular and cleaner production realization in small breweries' value chains. Furthermore, the article proposes a novel conceptual model to facilitate waste management and biomass valorization realization in small breweries value chains. Findings provide new insights that complement previous studies to overcome the challenges for waste management and biomass valorization in the sector. The article offers implications for theory, policymakers and managerial practice with repercussions on the production, environmental and financial issues.	Spent brewery grains	In this study different options of BSG valorization for small breweries were described as well as alternatives to using BSG as spent grains.	Particularly interesting could be the table with the valorization options on page 3.
5	2022	Philimon D. Nganyira. Godlisten N. Shao. Jovine K. Emmanuel	**Evaluating the potential applications of brewers' spent grain in biogas generation, food and biotechnology industry: A review**	(PDF) Evaluating the potential applications of brewers' spent grain in biogas generation, food and biotechnology industry: A review (researchgate.net)	https://www-researchgate-net.translate.goog/publication/364429146_Evaluating_the_potential_applications_of_brewers'_spent_grain_in_biogas_generation_food_and_biotechnology_industry_A_review?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp&_x_tr_hist=true	University of Dar Es Salaam, Mkwawa University College of Education	Breweries, as the major users of fossil fuels, are constantly under economic and environmental pressure to minimize energy consumption and residual management costs. Biogas generation from brewing wastes is a realistic solution for significantly reducing fossil fuel use. Brewers' spent grain (BSG) forms about eighty per cent of the total wastes from a brewing plant. BSG has a high cellulose and non-cellulosic polysaccharides content which makes it potential for biogas production. This paper reviews the potential applications of BSG as an alternative substrate for production of biogas and the recent achievements which have been attained in anaerobic digestion (AD) technology. The usability of BSG in diverse technologies including production of animal and human food and as a medium for growing microorganisms and enzymes is reviewed. The chemical processes involved in producing biogas from BSG are discussed.	Spent brewery grains	A review of potential applications of BSG in different technologies.	
6	2022	Ines Ben Rejeb. Ichrak Charfi. Safa Baraketi. Hanine Hached. Mohamed Gargouri.	**Bread Surplus: A Cumulative Waste or a Staple Material for High-Value Products?**	Molecules | Free Full-Text | Bread Surplus: A Cumulative Waste or a Staple Material for High-Value Products? (mdpi.com)	https://www-mdpi-com.translate.goog/1420-3049/27/23/8410?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	University of Carthage, Université Libre de Tunis	Food waste has been widely valorized in the past years in order to develop eco-friendly materials. Among others, bread waste is currently of increasing interest, as it is considered a huge global issue with serious environmental impacts and significant economic losses that have become even greater in the post-pandemic years due to an increase in cereal prices, which has led to higher production costs and bread prices. Owing to its richness in polysaccharides, bread waste has been previously studied for its physico-chemical characteristics and its numerous biotechnological applications. The present review highlights the re-use of bread waste and its valorization as a valuable resource by making value-added products through numerous technological processes to increase efficiency at all stages. Many research studies reporting several transformation methods of surplus bread into ethanol, lactic acid, succinic acid, biohydrogen, hydroxymethylfurfural, proteins and pigments, glucose–fructose syrup, aroma compounds, and enzymes are widely discussed. The wide variety of suggested applications for recycling bread waste provides significant insights into the role of technology development in potentially maximizing resource recovery and consequently contributing to environmental performance by reducing the amount of bread waste in landfills.	Bakery production waste products	This review gives an overview of potential valorization products from reprocessing bread waste.	
7	2022	Claudio Cacace. Carlo Giuseppe Rizzello. Gennaro Brunetti. Michela Verniö Claudio Cocozza.	**Reuse of Wasted Bread as Soil Amendment: Bioprocessing, Effects on Alkaline Soil and Escarole (Cichorium endivia) production**	Foods | Free Full-Text | Reuse of Wasted Bread as Soil Amendment: Bioprocessing, Effects on Alkaline Soil and Escarole (Cichorium endivia) Production (mdpi.com)	https://www-mdpi-com.translate.goog/2304-8158/11/2/189?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	University of Bari, University of Rome	In an era characterized by land degradation, climate change, and a growing population, ensuring high-yield productions with limited resources is of utmost importance. In this context, the use of novel soil amendments and the exploitation of plant growth-promoting microorganisms potential are considered promising tools for developing a more sustainable primary production. This study aimed at investigating the potential of bread, which represents a large portion of the global food waste, to be used as an organic soil amendment. A bioprocessed wasted bread, obtained by an enzymatic treatment coupled with fermentation, together with unprocessed wasted bread were used as amendments in a pot trial. An integrated analytical plan aimed at assessing (i) the modification of the physicochemical properties of a typical Mediterranean alkaline agricultural soil, and (ii) the plant growth-promoting effect on escarole (Cicharium endivia var. Cuartana), used as indicator crop was carried out. Compared to the unamended soils, the use of biomasses raised the soil organic carbon content (up to 37%) and total nitrogen content (up to 40%). Moreover, the lower pH and the higher organic acid content, especially in bioprocessed wasted bread, determined a major availability of Mn, Fe, and Cu in amended soils. The escaroles from pots amended with raw and bioprocessed bread had a number of leaves, 1.7- and 1.4-fold higher than plants cultivated on unamended pots, respectively, showing no apparent phytotoxicity and thus confirming the possible re-utilization of such residual biomasses as agriculture amendments.	Bakery production waste products	This study describes the possibility of enzymatically transforming wasted bread into a soil amendment as a valorization option for balery product waste.	

8	2021	Anna Lissel (PR)	**Old bakery products as a basis for bioplastics and the chemical industry**	Press release 2021/02: Old bakery products as a basis for bioplastics and the chemical industry - Fraunhofer WKI	https://www-wki-fraunhofer-de.translate.goog/en/press-media/2021/PI_2021-02_old-bakery-products-as-a-basis-for-bioplastics-and-the-chemical-industry.html?_x_tr_sl=en&_x_tr_tl=de&_x_tr_hl=nl&_x_tr_pto=wapp	Fraunhofer Institute for Wood Research Wilhelm-Klauditz-Institute (WKI), University of Hohenheim	Plastics from unsold baked goods: Researchers have succeeded in extracting the basic chemical hydroxymethylfurfural (HMF) from old bakery products. HMF provides a starting material that can replace, for example, formaldehyde in bio-based adhesives. Furthermore, HMF can be used to produce bio-based plastics. The Fraunhofer WKI and the University of Hohenheim were successful in preparing HMF for further processing on a semi-industrial scale.	Bakery production waste products	This press release gives an overview of the process on how stale bakery products could be used as a raw material for the production of HMF, which is a monomer used for different polymer applications.	No original publication found, but could be interesting for further investigation.

5. Biomass availability studies and nutrient recycling

Please add biomass availability and nutrient recycling studies that you find of interest to the deployment of your bio-based solutions.

List of relevant studies

Solution 1: Spent brewery grains

Solution 2: Bakery production waste products

	Year	Author(s)	Title	Link	Translation link (German -> English)	Summary of contents	Relevant to which solution?	Why is it relevant?
1	2019	Christian Pladerer Philipp Hietier	Abfallvermeidung in der österreichischen Lebensmittelproduktion, Österreichisches Ökologie-Institut. Wien, 2017	https://united-against-waste.at/wp-content/uploads/2019/08/20190703_MMO_%C3%96sterr.Wasser-undAbfallwirtschaft_S.22-29_Studie_Pladerer_Hietler.pdf	-	In total, 121,800 tonnes (+/- 6%) of avoidable food waste are generated in food production in Upper Austria every year. This value was collected in a survey of large-scale productions, which turn over between 90% and 95% of all goods. This value is calculated on the basis of the member statistics of the Chamber of Commerce Food Industry Association. Almost half of all avoidable food waste is generated in the bakery sector (51,700 tonnes +/- 12%). 35,000 tonnes of this is bread and bakery products that food retailers return to producers as part of free returns. In beer breweries, 5,700 t of avoidable food waste is generated, according to this study	Spent brewery grains	generell overview about food wast and food production in Upper Austria. Information about food waste in different branches
2	2018	DI Philipp Hietler DI Christian Pladerer	Endbericht Lebensmittelabfälle in Österreich Aktualisierung des Lageberichts mit neuen Daten, rechtlichen Rahmenbedingungen und konkreten Handlungsempfehlungen. Pulswerk. Wien. 2018	https://www.pulswerk.at/download.php?f=532	-	The distinction between avoidable food waste and non-avoidable organic materials is very important and can be defined as follows: - Non-avoidable organic by-products/residues/wastes that are generated in the course of food production and are not suitable for human consumption (e.g. bones, blood, slaughterhouse waste, sour whey, pomace, ...). These must be disposed of, recycled or further processed accordingly. - Preventable food waste such as pre-packaged products, overstocked food, returned goods or edible raw products that are waste and must be disposed of. Returned goods are products that are transported back to the producer by the retailer when they are not sold and are offset. The reasons and causes for food losses in production are manifold and range from the manufacturing process, cleaning, quality assurance measures to overstocking and overproduction as well as returns, transport damage or foreign bodies in the product.	Spent brewery grains	generell overview about food wast and food production in Upper Austria. Reasons for the generation about avoidable food waste
3	2008	J. Bärnthaler, H. Bergmann, B. Drosg, D. Hornbachner, R. Kirchmayr, G. Konrad, Ch. Resch	Energiesysteme der Zukunft: Technologie, Logistik und Wirtschaftlichkeit von Biogas-Großanlagen auf Basis industrieller biogener Abfälle		-	A questionnaire cover around 82% of the Austiran beer market. It shows that around 17.4 kg of spent malt is produced per hectoliter of beer. In 2009, 8.7 million hectoliters of beer were produced in Austria. Different tables provide an overview of the quantities of biogenic residues. In 2004, a total of about 150,000 t of spent malt, malt kernels and malt dust were produced, yeast and yeast-like residues about 12,000 t.	Spent brewery grains	The study gives an overview about amount and current utilization of biogenic residues in beer production using the data of a questionnaire survey

4	2012	Hubert Reisinger Manfred Domenig Peter Thaler Christoph Lampert	Rückstände aus der Nahrungs und Genussmittelproduktion	https://www.umweltbundesamt.at/fileadmin/site/publikationen/rep0403.pdf	-	In this sector, 90% of the market is shared by commercial bakers and 10% by industrial companies. It also includes the flour milling, baking agent and pasta industries. In production, a surplus of 1.5% to 2% is common in order to meet certain deliveries. A distinction must be made here between by-products that are generated in the manufacturing process during production and finished bakery products that are left over in sales as scrap goods. By-products of production are mainly dough types. Weather and seasonal factors influence the quantity of returned goods. Based on the reports of a well-known bakery producer, the waste dough production amounts to 3.5% of the bakery production. If this percentage is applied to the total baked goods produced in Austria of about 599,000 tons (STATISTIK AUSTRIA 2010), this results in an annual generation for SN 11111 "Dough" of about 21,000 tons.	Bakery production waste products	Gives a good overview on waste production in bakery branch deviding between returned goods and waste dough production
5	2022	Rudolf BRAUN Arthur WELLINGER	Potential of Co-digestion	https://task37.ieabioenergy.com/wp-content/uploads/sites/32/2022/02/Potential_of_Codigestion_short_Brosch221203.pdf	-	400 - 800 t yeast and yeast like products and sludge from breweries, wine making, distilleries,	Spent brewery grains	Information on waste from brewery industry
6	2023	suedtreber	Biertreber	https://cms.dextermedia.de/dcmpro/documents/05778008451/Biertreber_Infoblatt.pdf	-	nutrient content of brewers grains	Spent brewery grains	nutrient content of brewers grains
7	2023	suedtreber	Bierhefe	https://cms.dextermedia.de/dcmpro/documents/05778008451/Bierhefe.pdf	-	nutrient content of brewers yeast	Spent brewery grains	nutrient content of brewers yeast
8	2023	Deutsches Ernährungsberatungs- und Informationsnetz	Nährstofftabellen und Inhaltsstoffe verschiedener Brottypen	https://www.ernaehrung.de/lebensmittel/	https://www-ernaehrung-de.translate.goog/lebensmittel/?_x_tr_sl=de&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	nutrient content of all different kind of bread	Bakery production waste products	nutrient content of all different kind of bread
9	2021	Philipp Hietler, Carla Hopfner, Christian Pladerer	Brot ist kostbar! Ohne Mist! Handlungsanleitung zur Reduktion von vermeidbaren Brot- und Backwarenabfällen entlang der Wertschöpfungskette	https://www.bmk.gv.at/themen/klima_umwelt/abfall/abfallvermeidung/publikationen/brot-ist-kostbar.html	https://www-bmk-gv-at.translate.goog/themen/klima_umwelt/abfall/abfallvermeidung/publikationen/brot-ist-kostbar.html?_x_tr_sl=de&_x_tr_tl=en&_x_tr_hl=nl&_x_tr_pto=wapp	amount of backery production waste products and innovative ideas against food waste in the baking industry	Bakery production waste products	Innovative ideas against food waste in the baking industry
10	2012	Hubert Reisinger Manfred Domenig Peter Thaler Christoph Lampert	Rückstände aus der Nahrungsund Genussmittelproduktion	https://www.umweltbundesamt.at/fileadmin/site/publikationen/rep0403.pdf		Estimated waste generation and best practice examples, Recycling and techniques of waste treatment	Bakery production waste products	Waste prevention in the bakery sector

11	2016	Urs Baier Lona Mosberger Dominik Gröbly Jürg Buchli Claudia Müller	ORGANISCHE VERLUSTE AUS DER LEBENSMITTELINDUSTRIE IN DER SCHWEIZ. Massenflussanalyse nach Branchen Ursachen / Verwertung	https://www.bafu.admin.ch/dam/bafu/de/dokumente/abfall/externe-studien-berichte/organische-verlusteausderlebensmittelindustrie.pdf.download.pdf/organische-verlusteausderlebensmittelindustrie.pdf		Cereals and bakery products: Branch bakeries have to reckon with up to 50 m3/a bread losses. It is also known that this value can be reduced by up to 20 % with better planning (Meteolytix presentation). The losses in the production of small rolls (gate to gate) in very large baking plants amount to an annual average of 4 %, based on the final product dry matter (confidential). In biscuit production, losses of 6.1 % to 16 % occur, depending on the product and the process used, in relation to the quantity produced. The greatest losses are generated by the cutting process for biscuits, where a large bar is first produced and then cut up (confidential information from a large manufacturer). Finished products: The losses incurred in the production of fresh pasta also depend on the type of product and range from 3.75 % to a maximum of 34 % (confidential information from an SME).	Bakery production waste products	Study based on a survey conducted in Switzerland on food losses/waste in manufacturing companies. Mainly conducted in the baking industry.