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FACTSHEET #8

Biomass Availability, Quality, Supply and Sustainability

01 THE CHALLENGE

In the context of the development of the bioeconomy, the sustainable and reliable supply of non-food biomass feedstock of the right quality is a critical success factor for the long-term perspective of biomass-based technologies to implement bio-based products on a large scale, while not competing with the food market and also benefiting local rural development.

02 HOW COORDINATION AND SUPPORT ACTIONS (CSAs) ADDRESS THE CHALLENGE

Biomass availability studies focus on a broader range of biomass types coming from diverse sources, from land and sea – such as crops, forests, fish, animals and micro-organisms, waste, etc. The presented projects all develop one or more decision support tools, e.g. offering insight on national/regional biomass availability and on suitable technologies for converting the biomass.

Biomass availability: Pan-European focus

S2BIOM aimed to support the sustainable delivery of non-food biomass feedstock at local, regional and pan European level through developing strategies and roadmaps. The project developed a planning toolset (with associated databases) containing up to date and harmonised **datasets for the availability of lignocellulosic biomass** in EU27, western Balkans, Turkey, Moldova and Ukraine. Further outcomes include **Bio2Match**, a tool for matching biomass and conversion technologies, a database proving information on the **regulatory and financial framework** impacting bioeconomy development throughout Europe, and a set of **country roadmaps** for lignocellulosic biomass exploitation and relevant policies for a bio-based economy in 2030.

Biomass availability: Regional focus

BIOREG modelled and mapped theoretical and technical potentials of wood waste, including wood in municipal waste, demolition wood and wood waste from industry, at NUTS2 level[1]. The study on regional potential had a special focus on the regions Normandy (France), Alentejo (Portugal), Lisbon (Portugal) and Lubelskie (Poland).

ICT-BIOCHAIN objective is to identify opportunities for the introduction of ICT, Internet of Things and Industry 4.0 to increase the efficiency and sustainability of high potential biomass supply chains for the bio-based industry. The project brings leading experts and support networks to develop Digital Innovation Hubs within ready-made test bed bioeconomy regions (South East Ireland and Andalusia). For both regions a **biomass availability data model / inventory** is under development. The report will also analyse the current use of selected biomass by-products.

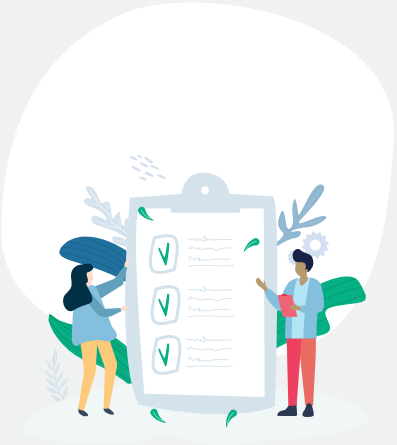
ENABLING aims to support the spreading of best practices and innovation in the provision (production, pre-processing) of biomass for the bio-based industry. In particular, **ENABLING** aims at creating appropriate conditions for the development of efficient biomass to bio-based products and processes value chains. The project is collecting several cases of business models of circular economy in different value chains. One of the project deliverables under development is the **Biomass Matrix Tool**, an Excel template developed to help the user in evaluating the potential and available biomass and industrial processes, considering the different bio-based products pathways.

[1] The Nomenclature of Territorial Units for Statistics or NUTS is a geocode standard for referencing the subdivisions of countries for statistical purposes. Within the EU27 (excl.UK), there are 244 regions at NUTS 2.

Biomass sustainability criteria

Open-Bio explored **sustainability issues** relevant for bio-based products, building on lessons learned from biomass sustainability schemes for bioenergy and biofuels.

Star-ProBio aims to promote a more efficient and harmonised policy regulation framework, needed to promote the market-pull for bio-based products. This will be achieved by developing a fit-for-purpose sustainability scheme, including standards, labels and certifications for bio-based products.



Beyond Coordination and Support Actions (CSAs)

Biomass mobilisation and supply

In particular under Societal Challenge 2 (H2020) but also under various Interreg programmes a wide range of EU projects produced tools for biomass mapping, conversion and logistics, platforms for biomass trading, or handbooks and guidelines for smart biomass mobilisaton. Selected examples include: BioBoost, uP_running, GreenGain, BioRES, BiomassTrade Center II, AGROinLOG, sucellog, BIOmasudplus, SIMWOOD, INFRES, LogistEC and EuroPruning.

03 MAIN OUTCOMES FROM THE COORDINATION AND SUPPORT ACTIONS (CSAs)

- Pan-European datasets for the availability of biomass
- Regional datasets for selected biomass (by-product) streams
- Decision support tools e.g. for matching biomass and conversion technologies
- Platforms and marketplaces for biomass trading
- Good practices on developing biomass supply chains

04 GAPS TO BE ADDRESSED

- Lack of awareness and knowledge about emerging opportunities as well as the environmental and socio-economic benefits for regional development stemming from the exploitation of locally available biomass.
- Handling biomass is not an easy task as it is bulky, seasonally available, often heterogeneous and sometimes contaminated. Extensive and timely treatment may be needed (drying, separation, etc.), in particular when the added value compounds should be rapidly extracted.
- Economic industrial processing in biorefineries requires multiple biomass feedstock types, large volumes and efficient application/disposal of all co-products.
- Securing long-term supply of affordable and sustainable biomass and developing efficient and cost-effective logistics (including harvesting and storage), involving a large number of biomass producers and mobilising currently under-utilised biomass, is a challenge.
- Data on biomass availability, trade and use are often scarce, incomplete, hard to get (e.g. not available online or in digital format at all) and not easily comparable. Better statistics and harmonisation of reporting are needed on the use of biomass from agriculture, forestry, marine, and waste. Examples of gaps include: local/regional availability of biomass, (residue) availability in processing industries, international biomass trading.
- The biomass quality needs to be monitored continuously, especially for high-value bio-based applications, like cosmetics, pharma, etc. Compliance with high quality criteria should be ensured and certified.
- There is a need for integrated solutions, promoting full biomass cascade utilisation into diverse and cross-connected value chains.
- Better harmonisation of legislation across Europe (e.g. on definition/classification of (organic) waste, and end-of-waste) could improve the productive use of biomass, generating new socio-economic opportunities.

05 RECOMMENDATIONS

- Raise awareness, educate, involve and demonstrate to primary producers and industries the **added value and economic potential of a circular use of biomass** in the bio-based sector. Provide them with knowledge, support, technologies and logistics to deploy this opportunity, thus promoting local development.
- Debate among the local stakeholders (including authorities, enterprises, academia and primary producers) should be promoted **to identify effective, shared and sustainable solutions** and a better future use of biomass.
- Integrated activities at the local level (e.g. regional multi-stakeholder platforms) should be promoted, that **build and take advantage of the outcomes** of the mentioned projects (platforms, decision support systems, good practices, etc.)
- Ensure improved data collection methodologies, better comparable statistics, and easier data access **to fill data gaps on biomass availability, trade and use.**
- Periodically **conduct data availability studies,** in particular in sectors and areas where reliable statistical data is poor, also as (a) developments in bioeconomy technologies result in other feedstock types becoming of potential interest; (b) climate change may lead to crop types and yields changing over time; and (c) bioeconomic developments and structural changes have an impact on biomass availability.
- Support an **improved exploitation of biomass,** in particular of added-value compounds for high-quality applications, and the valorisation of underutilised biomass.
- Develop and refine easy-to-use tools to match information on (locally) available biomass with technologies **for full utilisation of biomass and sustainable production** of bio-based products.
- Future research should carefully **examine the synergies/conflicts and interdependencies** amongst the different biomass feedstocks and develop coherent indicators for careful evaluation of their quantity, quality and sustainability attributes and costs associated with their production and collection.
- Promote the harmonisation of waste and end-of-waste definition/classification across Europe, to **increase the cost-effective availability of feedstock.**

06

COORDINATION AND SUPPORT ACTIONS (CSAs) IN A NUTSHELL

Acronym/logo	Programme	Duration	Website
S2Biom	FP7	Sep 2013 - Nov 2016	www.s2biom.eu/en/
OPEN BIO	FP7	Nov 2013 - Oct 2016	www.open-bio.eu
STAR ProBio	H2020	May 2017 - Apr 2020	www.star-probio.eu
BioReg GIVE WOOD WASTE A CHANCE!	H2020	Jan 2017 - Dec 2019	www.bioreg.eu/project
ICT - BIOCHAIN	BBI JU	June 2018 - May 2020	www.ictbiochain.eu
enabling	H2020	Dec 2017 - Nov 2020	www.enabling-project.com

07 RESOURCES

Datasets for standardized biomass characterization developed for lignocellulosic biomass. **S2Biom project**
http://s2biom.alterra.wur.nl/web/guest/biomass-characteristics

Biomass cost-supply viewer. **S2Biom project**
http://s2biom.alterra.wur.nl/web/guest/biomass-cost

Bio2Match. Tool used to match between biomass resources and conversion technologies. **S2Biom project**
https://s2biom.wenr.wur.nl/bio2match

Regulatory and finanical framework. Instruments and measures fostering the development of regional bioeconomies. **S2Biom project**
https://s2biom.vito.be/

Roadmaps of 38 countries. **S2Biom project**
http://s2biom.alterra.wur.nl/web/guest/country-downloads

Mapping of EU model regions case studies and classification of wood. (October 2017). **BIOREG project**
http://bioreg.eu/project/wp-content/uploads/BioReg_D2.1/82567800-c261-11e8-b59b-0cc47a792c0a_id_82567800-c261-11e8-b59b-0cc47a792c0a.html

Bio-based sustainability schemes. (October 2016). **Open-Bio project**
https://www.biobasedeconomy.eu/app/uploads/sites/2/2017/07/Bio-based-sustainability-schemes.pdf

Acceptance factors among consumers and businesses for bio-based sustainability schemes (2017). **Star-ProBio project**
http://www.star-probio.eu/wp-content/uploads/2017/04/STAR-ProBio_D5.1_final.pdf

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